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CHOLERA.

Pathological Anatomy of Cholera.—In the last No. of this Journal (p. 125), we alluded to the observations first made by the late Prof. Horner, of the University of Pennsylvania, that after death from cholera, the epithelium of the mucous membrane of the alimentary canal is found exfoliated to a greater or less extent. In two valuable papers published in the *American Journal of the Medical Sciences* for May and August, 1835, Prof. Horner states that he found the following anatomical characters in the alimentary canal after death from cholera:—

"1st. A copious vesicular eruption, entirely distinct from the tumefaction of villi, muciparous follicles or glands, and which pervades the whole canal.

"2d. A lining membrane of coagulated lymph, which exists in the small intestines at least, if not in the stomach and colon also, and resembles in texture and mode of adhesion the membrane of croup.

"3d. Vascular derangements and phenomena which are confined almost exclusively, if not entirely so, to the venous system.

"4th. An exfoliation of the epidermic lining of the alimentary canal, whereby the extremities of the venous system are denuded and left patulous."

The croupy or diphtheritic exudation on the mucous membrane has been also observed by Virchow, Cruveilhier, and is fully described by Reinhardt and Leubuscher, who state that they found the congested mucous membrane of the large and small intestine "infiltrated to a greater or less extent with a solid exudation which, after Virchow, we would designate 'diphtheritic.' This exudation contained but little water, was of a grayish or yellowish-white colour, and under the microscope was amorphous. It was rendered translucent by acetic acid and caustic alkali, but resisted the action of the former for some time. The deposit began in the superficial

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layers of the mucous membrane, and was mostly confined to the membrane itself, but in certain parts it extended somewhat beyond, as in the small intestine where it filled up the spaces between the villi, fusing them together into a continuous mass, in which, by the aid of the microscope, the outline and tissue of some of the villi could occasionally be distinguished." * * * The extent of the effusion varies extremely. "Those parts where the hyperæmia has been most marked in the cold stage were principally affected. In the small intestine the ileum was the principal seat of the diphtheritic inflammation, particularly the vicinity of the ileo-cœcal valve, from which point it extended, lessening in intensity, to a variable distance upwards into the ileum or even into the jejunum." * * * "The exudation, without undergoing any degree of organization, gradually softened, the tissue in which it was contained softened with it. This process of disintegration commenced on the surface, and by extension to deeper parts produced a *loss of substance* of variable extent; subsequently having the character of common ulceration. In general, however, the cases were fatal before the diphtheritic matter was fully thrown off." (See *Gull's Report*, pp. 57-58.)

This diphtheritic exudation was also found on the lining membrane of the gall bladder by Pirogoff, Reinhardt and Leubuscher; and Briquet and Mignot record similar observations upon the occasional occurrence of inflammation of the gall bladder and ducts, with diphtheritic exudation upon the surface of the mucous membrane.

Some of the anatomical characters described by Prof. Horner have not been noticed by other observers, and with a view to further elucidate the subject, the College of Physicians of Philadelphia appointed a committee during the prevalence of the disease in 1849, to investigate the subject, and their report is worthy of especial consideration.

The subject was brought to the attention of the College on the 19th of June, 1849, by Professor Jackson, who remarked that "our great object in the investigation of the pathology of cholera was to arrive at facts clearly and accurately established. At present all is doubt, speculation, and hypothesis. The disease is now amongst us; let us examine it systematically and thoroughly, without prejudice, and unbiassed by the authority of names or systems. What are the anatomical lesions in cholera? We have it asserted, first by Dr. Horner, and subsequently by Dr. Boehm, of Berlin, that they consist in certain changes which occur in the mucous membrane of the alimentary canal, which are characteristic of the disease. Here then, is something definite to start with. Let us investigate the subject for ourselves, and ascertain whether the observations upon which the deductions of the two pathologists just named, are based, are correct. The ordinary procedure of laying open the intestines, and hastily examining their internal surface with the naked eye, amounts to nothing; the parts to be examined must be macerated and injected, and then examined by the aid of the microscope. This is the course that has been pursued by Dr. Horner, who has pointed out the only true method of prosecuting the inquiry. To arrive at any definite results, this plan must be followed out by good anatomists, and experienced microscopists. In this manner, and by such investigators, must the facts in relation to this subject be collected, and the result placed before the profession in the form of a report.

"Dr. Jackson moved, therefore, the appointment of a committee to investigate the anatomical lesions of the intestinal mucous membrane in cholera, and report the result of their labours at a future meeting of the College."

Under this resolution, Drs. Jackson, Neill, Pepper, H. H. Smith, and Goddard were appointed the Committee.

At the meeting of the College held on the 4th of December following, Professor Jackson submitted a report in which it was stated that:—

"The ordinary autopsical examinations heretofore practised, have failed to yield any satisfactory information, and are nearly useless for the purposes of science.

"Extensive structural lesions may exist that cannot be seen or very imperfectly discerned by the unaided sight, and without proper preparation.

"It was determined by the Committee that the intestines, before being submitted to examination, should be finely injected, and subsequently inspected with the microscope.

"This task was undertaken for the Com-

mittee, by Dr. John Neill, Demonstrator of Anatomy in the University of Pennsylvania. The admirable manner in which he has performed this duty can be judged of by the beautiful preparations now on the table, which he has presented to the College for its museum.

"The injections are made with turpentine coloured with vermilion. It was found by Dr. Neill, that when he employed size, it did not penetrate well, and numbers of capillaries were not filled; the same result occurred when Canada balsam was used. It led, at first, to the supposition that the capillaries were destroyed by the disease. The method last adopted, as the fine preparations on the table demonstrate, show the perfect integrity of the capillaries.

"A healthy intestine, taken from a subject who had died of pleurisy, was first injected as a standard of comparison. * * *

"The Committee, confining themselves strictly to the single object for which they were appointed, report the following facts as the result of their investigation. The preparations and drawings on the table will enable the Fellows to determine on the accuracy of the statement.

"1st. In the recent subject, the peritoneal coat, like all the serous membranes, was in all, remarkably dry. The lubricating serosity is deficient in the serous membranes.

"2d. The epithelial layer of the intestinal mucous membrane was, in all the specimens, either entirely removed, or was detached, adhering loosely as a pulpy layer mixed with mucus or an albuminoid substance. * * * * * *

"3d. *Peyerian glands.* Peyer's glands were developed to a greater or less extent in all the cases examined. * * *

"4th. *Solitary glands.* These were also developed, and contained, in the recent subject, a minute quantity of white substance. * * * * * * * *

"5th. *Villi.* They are denuded of the epithelial covering, but are unchanged in other respects. * * * * *

"6th *Capillary Vessels.* These are entire and manifest no departure from their normal state. The appearance of the capillaries of a cholera intestine is identical with those of the healthy mucous membrane when the epithelium has been removed. In the natural state the epithelium, from its thickness, conceals the injected capillaries. * * *

"In no instance was a vesicular eruption observed."

The foregoing facts, derived from the examination of twenty-five subjects, illustrated by preparations most carefully made by Dr. Neill, are of the highest value, and shed important light on the pathological anatomy of cholera. They have been strangely overlooked, and we will therefore refer to the published *Transactions* of the college and also to the number of the *American Journal of the Medical Sciences* for April, 1850, in which will be found the report in full with coloured drawings of Dr. Neill's preparations.

Dr. Neill's preparations presented to the College are still preserved in their Pathological Museum at the Hall of the College.

These investigations, as well as the facts already stated, fully demonstrate that the alimentary canal is the seat of the morbid actions which constitute cholera. Whether or not the cause of cholera, whatever it may be, acts primarily on the ganglionic nervous centres and through them on the intestinal canal, or its primary action is on the latter, we leave it to others to discuss.[1] Either theories will explain all the phenomena; but as no lesions have been usually found in the ganglionic nervous centres, while those in the alimentary tube are constant and serious, it seems questionable whether it is sound philosophy to go beyond the latter or to seek for more causes than are sufficient to account for the phenomena of the disease.

The Berlin pathologists, whose attention was particularly arrested by the occurrence of amorphous granular fibrin in and upon the affected surface of the mucous membrane, regarded cholera as a "*destructive diphtheritic inflammation.*" We must agree with Dr. Gull that "such generalizations, however plausible, are of little value, and that we arrest inquiry by their adoption." The excessive exosmosis from the mucous membrane of the alimentary canal, by depriving the blood of its most important anatomical element—water—and its salts, suffices in our judgment to fully account for all the phenomena of the disease.

[1] That the cause of cholera does not act primarily on the blood, inducing a change in it which leads to exosmosis of its fluid constituents and salts, is shown by the investigations of Dr. O'Shaughnessy, which demonstrate that no changes can be discovered in the blood until *after* the exosmosis has occurred.

Dr. Gull, in his report (p. 118), speaks of the loss of the epithelium as "in itself an unimportant change." We cannot so regard it. On the contrary, we believe it to be a most disastrous condition, and disastrous exactly in proportion to its extent. Not only by the destruction of the mechanism of absorption which it involves, does it constitute the great obstacle to the restorative processes, preventing the supply to the blood of the materials it has lost, and rendering remedies inoperative; but the irritation resulting, when a large surface is denuded, may of itself prove fatal, like an extensive scald of the skin, even when very superficial.

We are happy to quote in support of our views so high an authority as Dr. Lionel Beale, the first number of whose "Microscopical Researches on Cholera" (*Méd Times and Gaz*, Aug. 4, 1860) has reached us since the above article was in type.

This eminent microscopist says: "Every one who has seen cholera has been struck by the remarkable characters of the matter discharged from the intestinal tube, and those who have made post-mortems are familiar with the fact that the small intestines almost always contain a considerable quantity of pale, almost colourless gruel, rice, or cream-like matter. This has been proved to consist almost entirely of columnar epithelium, and in very many cases large flakes can be found, consisting of several uninjured epithelial sheaths of the villi. I have often found such sheaths in the stools in previous epidemics, and probably every one who has carefully observed the disease will have inclined towards the opinion that in bad cases it is probable that almost every villus, from the pylorus to the ileo-cæcal valve, has been stripped of its epithelial coating during life.

"This alteration in the apparatus concerned in the absorption of all nutrient matters from the intestinal canal, and the changes accompanying it and preceding it, are probably sufficient to account for death by collapse. Most important, therefore, is it to ascertain, if possible, the several phenomena of which this denudation of epithelium is the climax, and the order in which they occur. These important organs, the villi, are, in a very bad case, all, or nearly all, left bare, and a very essential part of what constitutes the absorbing apparatus is completely destroyed. If only a considerable portion of a villus was denuded, reparation might doubtless occur by new growth from the cells which remained, but if the villus was entirely stripped, it is more probable that it would waste, and its place be at length occupied by a new one, which would grow from its base, than that epithelium would grow anew from its bare surface. It is probable that the extent of this process of denudation determines the severity or mildness of the attack. If the great majority of the villi have suffered, it is scarcely reasonable to consider recovery more probable than it would be after a very extensive burn or scald."

—

Pathology of Cholera.—Dr. G. H. Barlow, Physician to Guy's Hospital, has very recently published (*Med. Times and Gaz.*, July 28, and Aug. 4th, 1866) some investigations which strongly sustain the views we have endeavoured to establish in our last No., in regard to the importance of water in the animal system, and the disastrous effects resulting from its rapid loss. We strongly recommend his observations to the consideration of our readers.

Dr. Barlow inquires: "1. What is the office performed by water in the animal economy? 2. What are the effects to be apprehended from its defect or rapid withdrawal? 3. How far are these *a priori* anticipations verified in other diseases than cholera? or, to put the proposition in a more comprehensible form, what symptoms do we observe when the admission of water into the circulation is interfered with, or when it is too rapidly eliminated from the system, or when the right performance of its functions is interfered with by disease in any organ! 4. How do these symptoms coincide with the prominent ones observed in the more advanced stages of cholera? And here I would observe that in the diarrhœa of cholera we have to do with the withdrawal of serosity—that is, of water with a small amount of salts—from the system; and that, therefore, I reject, as leading to error, all analogies drawn from the abstraction of blood or even serous fluids, though I may hereafter advert to the effects of such discharges as affording by contrast a remarkable confutation of the views in support of which they have been adduced. What, then, is the office of water in the animal economy? The water which is received into the stomach is, with such

soluble matters contained in it as are not decomposed in the primæ viæ, taken up by the capillary branches of the veins which converge to form the venæ portæ, carried onwards with the blood through the trunk of that vein; here a portion of it is separated in order to furnish a solvent for the solid contents of the bile. Passing onwards through the pulmonic and systemic circulation, the redundant water of the blood carries with it those inorganic soluble matters which it contained at first, and receives, or rather acts as a solvent to, those effete products of the interaction of the blood and the tissues which are to be expelled from the system, or at least from the nourishing fluid. Holding these substances in solution, it is carried on with the current of the blood to the other great excretory organs, the skin and the kidneys, whence it passes out of the system, carrying with it the substances which each of those organs is designed to eliminate, but which it cannot remove unless brought to it in solution.

Before proceeding to reply to my second query, I may remark that the entrance of water into the circulation may be opposed as it were *in limine* by obstructions high up in the alimentary canal; again, its passage may be intercepted in the portal system, as by disease of the liver, or even further on in the heart and lungs; all which obstructions may be so great as to prevent there being such a supply of redundant water in the blood as is requisite for the solution of the excretory matter, and from this cause there may arise inquination of the blood by these substances.

When the ingestion of fluid is obstructed at the commencement of the small intestine, we should apprehend, *a priori*, general diminution of the volume of the circulation, with changes in the physical character of the blood arising from the defect of water in proportion to the other ingredients; and as the effect of this, derangement of the circulation, gradual failure of the motor powers of the heart from the withdrawal of its natural stimulus, consequent congestion of the lungs, lividity, suppressed secretion, and urgent thirst. When the obstruction is further on in the course of the circulation—as in disease of the liver, whether primary or arising from obstructed circulation in the chest—we should anticipate, as regards the circulation, effects much of the same kind as in the former instance, though of a less intense character; since we cannot conceive of any obstruction taking place in the portal or pulmonic circulation, such as would intercept the current of the fluid so perfectly as occurs sometimes in obstruction in the small intestine. There would also be this difference that the obstruction would be either in or beyond the circulation through the liver; and, therefore, we should anticipate escape of fluid from the circulation tergal to the obstruction and the effects of a deficiency of fluid beyond. We should, in fact, expect no deficiency in the biliary secretion, but rather a tendency to diarrhœa or dropsy, the congestion, lividity, and diminished secretion from the kidneys being the same as in the former instance. It is needless to occupy time by speaking of obstructions further on in the system than the mitral valve, since beyond it the fluid may be considered to have fairly found its way into the circulation; and although such obstructions do occur, they are propagated backwards, and ultimately resolve themselves into obstructions at or tergal to the mitral valve. I therefore pass on to the main outlet by which the fluid makes its exit from the system, and through which it ought to carry the soluble excretory matter, the urea, the urates, etc. Now, if this organ be diseased so as to obstruct the exit of the fluid, we should expect the effects of retained fluid, such as dropsy, together with those of toxæmia—*e. g.* head affection, spasm; but if it were so affected that it allowed the passage of the fluid, but not the elimination of the excretory matters, we should expect the uræmic symptoms only.

I now proceed to the third query, How far are these *a priori* anticipations verified by what we actually meet with in disease? Most of us have seen several—few can have been long engaged in practice, or have spent any time in the wards of our hospitals, without witnessing some—of those cases in which there is obstruction in the duodenum, or high in the jejunum. The appearance of the subject of this serious lesion cannot but strike any one who has an eye for what I would call the physiognomy of disease. I am somewhat anticipating, but I do not hesitate to aver that to the eye he presents the most exact resemblance to a cholera patient—not a mere approach to it. And what have we to account for this condition? All the ingesta taken into the stomach are instantly rejected—there can no fluid pass

into the small intestines or be absorbed thence by the mesenteric veins, the drain from the blood by the excretions cannot be repaired, and the fluidity of the blood is not maintained. The impaired fluidity of the blood prevents the access of that fluid to the air in the lungs, and one important moving power of the pulmonic circulation is suspended—I would rather say that *the* motor power of the capillary circulation of that system is so—and what is the consequence? The blood is arrested in the pulmonic arteries, there are pulmonic congestion and its consequences, lividity, a short cough, dyspnœa, a husky voice; but more than this, the fluidity of the blood being nearly destroyed, the interaction between the blood and the tissues in the systemic circulation languishes, organic functions, or, at all events, the eremacausis, upon which animal heat depends, is arrested, and therefore the temperature rapidly sinks; when we come to examine this patient more closely we shall find that, though able to speak, to move himself, to sit up in bed, and even to walk, he is pulseless: he is organically dead, or nearly so; he has the cold and shrunken extremities of cholera, and its cold tongue and breath. If we inquire further we shall find that the secretion of urine is not merely diminished, it is absolutely suppressed. I do not imagine that any one in this Society will accuse me of adducing a fictitious case, though perhaps some may imagine that I have grouped together the more remarkable symptoms found in several cases of this kind in order to produce a typical case. I beg to say that all the symptoms which I have here described presented themselves in a boy who was my patient in the clinical ward twenty-one years ago, and who passed no urine for five days before his death, and that I have met with several such since. In this case, I may add, there was found upon inspection occlusion of a portion of the duodenum by adhesion and a band of false membrane. The lungs and right heart were in a state of congestion; there were, in fact, besides the abdominal lesion, the anatomical conditions of a subject dying from asphyxia. When there is intestinal obstruction from disease further on or in the course of the small intestines, we generally find more or less depression of the moving power of the circulation; greater or less diminution of the secretion of urine; more or less, in fact, of the symptoms described in connection with duodenal obstructions, according as we have the disease higher or lower in the intestine, or, at all events, according to the earlier or later or more or less urgent vomiting—according, in short, as we have a greater or less obstacle to the admission of fluid into the system. When there is obstruction beyond the ileo-cæcal valve, the condition of the patient is altogether different. There may be obstinate constipation for days together without vomiting, and therefore with an abundant secretion of urine.

If now we take a glance at the course of the fluid from the intestinal canal to the right auricle, we often meet with cases of chronic disease of the liver—as, for instance, cirrhosis or fibroid degeneration—in which the portal circulation is materially interfered with. In these cases the urine is for the most part scanty; but there are generally none of the effects of retained secretions, since the general nutrition of the body is feeble and the waste of tissues slow; but what is remarkable is, that in such cases we have rarely, if ever, a tendency to diarrhœa, though we often induce it as a means of relief; but, on the other hand, the redundant fluid obstructed in the portal circulation is relieved by the escape of serum (not serosity) into the serous membrane of the abdomen and afterwards into the areolar tissue of the lower extremities, giving rise to ascites and anasarca.

Cases again sometimes present themselves, and though rare they are highly interesting and instructive, in which the ascending cava is obstructed as high sometimes as its entrance into the right auricle by the development of a new growth from its lining membrane, so that the orifice of the vena porta hepatica is nearly closed and the circulation through the liver greatly obstructed. Here then we have the greater portion of circulating fluid intercepted just before it reaches the pulmonic system, and there is an approach to the conditions of cholera as assigned to it by Dr. Johnson. What, under these circumstances, do we find to be the effects upon other parts of the system? There is, as in the instances of intestinal obstruction, a great diminution in the quantity of the urine; there is thirst, a feeble pulse, some coldness of the extremities, and other signs of a languid circulation. This obstruction, however, rarely finds a

vent, at least spontaneously, in the form of diarrhœa; but there are ascites, hematemesis, and sometimes intestinal hemorrhage.

We find, then, that in those cases in which there is obstruction to the passage of the fluid from the portal system into the general circulation, there are some of the symptoms which we have ascribed to defect of fluid in the system or a drain of fluid from it—a feeble action of the heart and arteries, thirst, and scanty urine—some, in fact, though in a less degree, of the symptoms of cholera. These are superadded to the other symptoms due to the mode in which the obstruction is produced, or, in other words, to the manner in which the deficiency of the fluid in the system is brought about.

We now pass on to obstructions in the pulmonic system, and we arrive at a condition of things almost identical with the hypothetical 'stoppage of blood from the right to the left side of the heart,' which has been assumed as the cause of the collapse of cholera; and, indeed, upon the theory which I have advanced of the necessity for a free transit of fluid through the system, there ought to be some of the symptoms of cholera—those, in fact, which are due to diminished flow onwards into the arterial system (whether that diminution arise from abstraction or impediment), though, according to the theory that affirms this stoppage as the potential cause of the phenomena of the disease, we ought to have cholera itself. What, then, do we really meet with? With lividity from the imperfect arterialization of the blood we have often coldness of the extremities, and now and then cramps. From the diminished arterial circulation we have scanty urine, very small and sometimes almost imperceptible pulse, and after a time gorged liver and ascites. We have, in fact, those symptoms of cholera which may be explained by the conditions which these cases have in common with cholera, namely, the diminished arterial circulation and scanty urine. But we have also other symptoms—a great impulse of the heart, due to the gorged right ventricle and enlarged liver and ascites—symptoms to be explained by conditions which are present in these cases but are absent in cholera; while, on the other hand, we have not the symptoms of true cholera, watery vomiting and purging.

Cases of this sort present themselves under various forms. Thus acute and extensive bronchitis may be set up and rapidly develop itself, and we have obstruction to the capillary circulation in the lungs between, as it were, the pulmonic arteries and veins. Some of these cases are rapidly fatal, and we have before death urgent dyspnœa, lividity, clammy extremities, very small and rapid pulse, scanty urine, but not diarrhœa, still less cholera. After death, besides the condition of the bronchial membrane characteristic of bronchitis, we have the right side of the heart and pulmonic arteries gorged, and a comparatively empty condition of the pulmonic veins and left heart. Similar instances may be found in cases of acute phthisis, fatal in a few days, which sometimes presents themselves.

When again, there is disease of the mitral valve, whether obstructive or regurgitant, we have a similar state of things as regards the right heart and pulmonic arteries, but there is in addition engorgement of the pulmonic veins and left auricle, the left ventricle being comparatively empty in cases of obstruction, though moderately full where there is regurgitation. Here we have dyspnœa, thirst, very cold extremities, a feeble (often intermittent and sometimes imperceptible) pulse, and scanty urine, but we have not cholera. These cases do no doubt present many symptoms in common with cholera—those in fact which are due to diminished supply of fluid to the arterial system, not as in cholera from its abstraction, but from obstruction to its access. Affections of the aortic valves do not produce in their earlier stages any serious obstruction to the pulmonic circulation or impediment to the ingress of fluid into the system; and later their effects become almost identical with those of affections of the mitral valve.

I now proceed to consider the effects produced by derangement of those organs by which the principal part of the water is finally removed from the system, and which, when healthy, eliminate with the water the soluble excrementitious matters which it holds in solution, but which, without a due supply of that fluid, would act as poisons as certainly as would carbonic acid if there were not free access to the lungs. It is a fact which pathologists hardly seem fully to appreciate that water is as much a depurating agent as is air, and one the want of which is as certainly, though not quite so

speedily, fatal. In several of the different forms of Bright's disease, then, we have not necessarily any obstruction to the passage of fluid into the system, neither is there in many cases any impediment to its exit from it. The quantity of water in the blood may be as great in proportion to the normal solid contents as in health; in the majority of instances it is greater, but, owing to disease of the excretory organs, the water passes away, leaving in the system the very substance which it was intended to eliminate (namely, the urea, urates, etc.); and what symptoms do these cases present in common with those which have just been mentioned, or in common with cholera! As regards the former the urine may or may not be scanty; there may or may not be dropsy, but there is almost always thirst, especially in those cases in which the deficiency in the normal solid contents of the urine is greatest, and in those cases there are commonly cramps. Now, if in nearly all the cases in which there is a suspension of the elimination of these soluble excretory matters from the system, whether that suspension arise from the obstruction to the admission of water (the solvent) into the system, from obstruction to its transmission and distribution to the eliminating organs, or from its rapid withdrawal by another and unusual source, as in cholera, or from its passing out of the system without performing its office of elimination, as in Bright's disease—if, I say, in all these instances we have thirst and cramps, and the only condition which they present in common is the defective elimination of these excretory matters, we cannot, I think, be far wrong in assuming that retained secretion or uræmic poisoning is the cause of the thirst in all these cases, and that it is a potential agent, though not the only one, in the production of cramps.

I have now traced the course of the liquid taken into the stomach to its elimination from the system, and have found that when its admission into the system is cut off at the very commencement, there are all or nearly all the symptoms of cholera, with the exception of the diarrhœa—the cramps, it is true, being of somewhat less intensity.

It is remarkable too that in the course of this inquiry we have had occasion to notice the effects of obstruction in the pulmonic circulation, whether arising in the lungs themselves or produced by disease of the heart, and we have observed that although we had some effects common also to cholera, they were precisely those which we had been led to expect would ensue from obstruction to the passage of fluid from the portal system to the general circulation, but that those choleraic symptoms which ought to have presented themselves upon the hypothesis of the origin of cholera from pulmonic obstruction were precisely those which were wanting. We see, then, that the pulmonic obstruction is not a *vera causa*, since it is not one of the existence of which we have any evidence antecedently to the other choleraic symptoms or independently of them. Neither is it capable of accounting for the phenomena of the disease, since when present as a primary affection or in the course of other diseases it does not give rise to these phenomena.

There remains one other disease to be noticed as affording powerful evidence of the effect of a drain of fluid from the system in producing the thirst, cramps, collapse, suppression of urine, imperceptible pulse, and, in short, all the symptoms of cholera—I mean the English or summer cholera. Now in most summers we have this disease occurring to a greater or less extent, and in greater or less degrees of intensity. In some cases it is a matter of very little moment; in others the diarrhœa goes on to an extent that is exhausting to the patient; and in some few cases we meet with the thirst, suppression of urine, cramps, lividity, and collapse, and, in short, the condition of the patient so closely resembles that of one passing into the collapse of true Asiatic cholera that it is impossible for any one by mere examination of the patient to distinguish it, the only guide being the character of the prevailing epidemic. I have more than once seen cases of this kind, of which I have said, if Asiatic cholera were now prevalent I should say that there was hardly a chance of the recovery of this patient, but as it is not, I hope, and even expect, that he will do well; and such has been the case in every instance which I have seen, with the exception of the aged and of diseased persons—the collapse not having been so profound as in the epidemic form of the disease, and the rice-water dejections not quite so copious.

It may, indeed, be urged on the one hand that these cases are not English cholera at all, but sporadic cases of true cholera, and

on the other that if they are rarely fatal, though they present nearly the same drain of fluid from the system, there must be some other cause in operation in the true cholera to produce a more generally fatal result.

Now to the first of these objections I would reply that these cases of English (or non-epidemic) cholera had been known to experienced practitioners long before the appearance of the Asiatic disease in this country, certainly as far back as the time of Sydenham. A similar disease, too, has long been known in other parts of Europe, and was described by Celsus.

In reply to the second objection, although I am by no means certain that the drain of fluid in these cases is as perfect as in the true cholera, yet it is not here meant to assert that the sickness and diarrhœa constitute the whole of cholera, but merely that the drain of fluid is the cause of its most prominent or dangerous symptoms. There are no doubt other morbific agencies in operation, of which I shall presently take occasion to speak.

Having now shown that when in the course of other diseases we have a great defect in the quantity of fluid in the circulation, whether that deficiency arises from obstruction to the entrance of the fluid or from its very rapid abstraction, we have symptoms more or less resembling those of cholera, according to the completeness of the obstruction or the amount of the abstraction, I think that we are justified in concluding that in cholera, where we have the same result and the same agency in operation, we are bound to accept that agency as the cause in this case as in the former.

I now proceed to notice some of the objections which have been made to the doctrine that the sickness and diarrhœa, or in other words the drain of fluid, is a potential agent in the production of the most characteristic symptoms of cholera. Now, first of all it has been objected that 'a copious hemorrhage, a profuse and long-continued leucorrhœa, prolonged lactation, and excessive purging, whether the effect of disease or medicine,' do not produce effects similar to those ascribed to the choleraic drain. It is difficult to suppress admiration of the ingenuity which should have colligated conditions so different as a drain of blood or albuminous fluid and a drain of serosity. I have already commented upon the inconsistency of comparing the abstraction of a portion of the whole blood, which for a time diminishes the volume of the circulation without interfering with the relative proportion of its ingredients, with the withdrawal of a large proportion of one of those ingredients; which, in addition to diminishing the volume of the circulation, absolutely destroys that relative proportion which is essential to its integrity and to its power of supporting vital action. But we may even go further than this, and compare the physiological effects of hemorrhage with those of the abstraction of serosity only. When a large quantity of blood escapes, whether from a wound or from morbid hemorrhage, the first effect, no doubt, is a tendency to syncope, with some coldness and clamminess of the extremities. If the hemorrhage is not fatal, a reaction speedily ensues; the heart's action becomes excited, the pulse sharp and very compressible, the countenance and lips pale; there is no difficulty in the maintenance of the circulation, although its volume is diminished, and the functions of different organs are liable to be impaired or suspended from a defective supply. One of the earliest symptoms after reaction is thirst, and generally the patient drinks freely. The fluid thus taken is rapidly absorbed, and the volume of the circulation is restored, or nearly so, but not its constitution, nor the proportion of its ingredients, the blood which has been abstracted being replaced by water only, and so it happens, as is well known, that the state which used to be generally known by the term anæmia, but which is now more correctly termed spanæmia. is brought about. This spanæmia, or poorness of the blood, consists in a defect of solid contents with an excess of water, and being the very opposite of that which is induced by the drain of cholera or diarrhœa, in which the solid contents are in excess owing to the abstraction of the fluid, we need not stop to inquire why the symptoms are so different in the one case and in the other; their very difference presents us with as strong evidence as contrast can afford us.

The same remarks apply to leucorrhœa and to other albuminous discharges, as well as to over-lactation, in which, as is well known, a spanæmic condition of the blood is induced. In this state of spanæmia there is not only a deficiency of red corpuscles, but also of albumen, so that comparatively

to them the water is greatly in excess, or, in other words, is the very opposite condition to that induced by cholera. There remains diarrhœa, whether from disease or medicine: this is indeed a most legitimate subject of comparison, and if I am compelled to differ on matters of fact with those who have advanced an opposite theory to my own, I beg to say that I do this without arrogating to myself greater candour or more accurate observations than those from whom I differ, knowing, as I well do, the different aspects in which the same facts present themselves to different minds.

As regards diarrhœa pure and simple, the most perfect form in which it presents itself to our notice is that of the English cholera. Now this disease in its very severest form is not a common one; still I believe that few who have enjoyed great opportunities of witnessing disease can have missed seeing one or more such cases, and in them there can be little doubt that more or less collapse, cramps, and suppression of urine are the consequences of the diarrhœa. I was within the last few days talking to an old practitioner of great experience whom I attended two years ago (in the summer of 1864) for English cholera, and he observed that in his case the effect of the purging could not be questioned, for that after a very copious watery evacuation he felt suddenly prostrate and 'drawn into a ball' with cramps. As regards sudden attacks of diarrhœa which now and then occur in disease of the heart, lungs, liver, or kidneys, it is very true that they rarely, if ever, go to the extent of producing cramps and collapse—in the first place, because they generally are induced by obstructed circulation or excess of serous fluid, and being the result of a conservative effort on the part of Nature, they rarely, if ever, go on to such an extent as to become destructive; and I think, if it were admissible to introduce an argument for final causes into a question of this kind, that the very fact of choleraic diarrhœa being often fatal is an argument against its beginning in a conservative effort. Indeed, to suppose that the diarrhœa of cholera originates in a conservative effort of Nature is to compare Nature to an unskilful physician administering an excessive or uncalled-for dose of elaterium or other hydragogue cathartic. As regards excessive diarrhœa from medicine, I cannot speak much from my own experience. We have all of us, no doubt, seen cases in which an aperient has acted beyond our expectations and beyond our wishes, and in some of these cases the extremities have become cold, the skin clammy, and the pulse feeble; but it is, and ought to be, rare for cases to occur with any great severity. It does, indeed, sometimes happen that there is a peculiar susceptibility arising from the constitution of the individual, or from some tendency to disease prevailing at the time—from what, in short, Sydenham has termed the 'epidemic temperament'—under which circumstances an aperient may act violently, producing exhaustion, very feeble pulse, coldness of the extremities, in fact, the milder symptoms of cholera.

There remains one other fact in support of the view which has been taken of the consequences of the withdrawal of fluid from the circulation, and it is the effect which is known to have resulted from injecting it into the veins after the system has been emptied by such a drain. Now, it is well known that in some instances the circulation has been restored and the patient has recovered by transfusion. In other cases the pulse has returned, and the patient has expressed himself as feeling quite restored, but vomiting or diarrhœa, more frequently the former, have again drained off the fluid, and the collapse has recurred. The late Dr. Babington mentioned to me the case of a gentleman in whom transfusion was employed in the collapse of cholera. He rallied and sat up, and seized the Doctor's hand and said: 'Dr. Babington, you have restored my life;' but in a few minutes diarrhœa came on, and he again sank. What is remarkable as showing the effect of the injection is that in some of these cases bright fluid venous blood has flowed from the vein after the operation.

The facts may now thus be summed up. Obstruction to the admission of fluid into the circulation causes collapse, with tendency to asphyxia, suppression of urine, and, as a consequence of this suppression, some of the symptoms of uræmic poisoning. Obstruction further on in the course of the circulation, as in the liver, causes scanty urine, and in extreme cases there may be some of the symptoms of uræmic poisoning. Still further on, there will be lividity and scanty urine, with, in severe cases, the pulse of impending asphyxia, the circulation relieving itself by effusion of serum into the perito-

neum, and in some rare instances partially by diarrhœa. But if the fluid pass freely through the system to the kidneys, and find a free exit from the system, it may nevertheless, if those organs are diseased, pass out, leaving behind it the excretory matter which the kidneys should eliminate, and the symptoms of uræmic poisoning are the result. If, however, there be a rapid drain of fluid from the system, as in the instances of diarrhœa which have been cited, we have not only uræmic poisoning, but collapse and other consequences of the defect of fluid in the circulation—the effects being the same, whether the defect arise from obstruction to the access of fluid, as in disease of the duodenum, or from excessive and severe diarrhœa."

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On the Physiological Formula of Cholera and of the Treatment.—[Dr. B. W. Richardson, of London, one of the most active and sagacious workers in the profession, has published (*Med. Times and Gazette*, Aug. 4, 1866), the following formula of the disease cholera, in which he places each point to be discussed in the character of a theorem. The remarkable coincidence between his views of the pathology of cholera and those we have endeavoured to establish in the previous number of this journal, are worthy of attention.]

"*Theorem I.—The symptoms of cholera are due to the separation of water from the albumen of the blood and of the tissues.*—This theorem, which the symptoms themselves suggest as true, and which has been accepted by considerable numbers of medical men, is demonstrated by the following synthesis:—

"If into a serous cavity of an inferior animal a given quantity of fluid of a specific gravity 100 degrees above that of the blood of the animal be slowly injected, there is an immediate transference of watery fluid from the blood to the injected fluid, the osmotic current being specially rapid towards the denser liquid that has been injected. The serous cavity thus fills rapidly with fluid, and if the fluid exuded be drawn off the drain will be sufficient to cause death by mere loss of water. The symptoms consequent on this proceeding are identical with those of cholera; there is coldness of surface, coldness of breath, convulsive movement, shrinking of tissue, and general collapse. After death the morbid conditions found are the same as in cholera—viz: viscidity of blood, dryness of tissue, and shrunken condition of the vascular organs.

"Modifications of detail, according to the animal, are essential for this experiment; but all animals are susceptible of the symptoms. Common sugar, chloride of ammonium, and chloride of sodium are the three crystalloids most ready for the operator. For an animal weighing 1 lb., from one to two ounces of a solution of one of these salts, having a specific gravity of 1160, is sufficient. Symptoms precisely analogous to those of the collapse of cholera may be induced in frogs by injecting a fluidrachm of a crystalloid solution into the dorsal sac of the animal, or even by immersing the animal in a solution containing saline matter of a proper specific gravity.

"*Theorem II.—The separation of water in the blood in cholera is due either to a local osmotic change in the alimentary canal, or to a general osmotic change in the blood itself.*—By excluding all other possible causes of the separation, there remain none other but the two causes named above. The evidence in favour of each of these is very evenly balanced. The early symptoms of the disorder, and the fact that there is an unmistakable disposition towards exudation from the alimentary surface rather than from any other surface, strongly support the view that the cause of the disease—in the early stages at all events—is exclusively local in its action. On the other side, we find distinctive evidence of changes in the condition of the albumen of choleraic blood. This blood is deficient in hydrating power—in the capacity, that is to say, for taking up water—and hence it may be argued that the primary change is in the blood; that the water separates, and that, so separated, being deficient in plastic quality, it finds in the enormous vascular surface of the alimentary canal its readiest point of exit from the body.

"Physiological experiment again favours this view. If into the aorta of an animal just dead ordinary water be abundantly injected, the alimentary system is invariably the part that is first distended; nor is there ever anasarca of any tissue nor serous exudation until the alimentary system is saturated. If, therefore, the watery matter of the blood during life were separated so that the homogeneousness of the blood were

destroyed, the first point through which the watery matter would exude under the influence of the *vis a tergo* would be the surface of the alimentary canal; and further, as this is an open surface, from which the exuded fluid can freely escape, the exudation would naturally continue through that surface until the *vis a tergo* were exhausted.

"The view most consonant with all the facts is that the choleraic poison finds its way primarily into the alimentary canal; that in the albuminous secretions of the canal it sets up catalytic change leading to its own further production; that it is absorbed at first from this canal, and is carried, as alimentary substances are carried, into the blood; that in the blood it continues to exert its specific action on albuminous matter, leading to separation of water and after exudation of water in the manner above described. The disease thus becomes general from a local point.

"On the view as here stated, and on no other, we have an explanation of the variety of character of the malady in regard to duration of symptoms and degree of exudation. In cases where the poison, as first introduced, is small in quantity or comparatively inactive, the infection of the albuminous secretion of the mucous surface and the absorption into the blood would be prolonged, the separation of water would be gradual, and the exudation, an early symptom, would be progressive and determinately marked. In cases, again, where the choleraic poison produces rapid change of albuminous secretion, with quick absorption into the blood, the homogeneousness of the blood would be destroyed with such rapidity as to leave no time for exudation prior to death.

"*Theorem III.—The collapse of cholera is due not only to the elimination of water from the system, but to the removal by the water of the heat of fluidity or latent heat of the tissues.*—This argument, which has an important bearing on the question of treatment of cholera, is based on a series of new researches I have recently conducted, and to which, in future papers on the heat of fluidity of the animal body, I shall invite the attention of the readers of this journal. *In limine*, I may say here that each part of the body that has the property of being transferred from the solid to the liquid, and conversely from the liquid to the solid condition, possesses a given capacity for latent heat, or heat of fluidity, and that the process by which the body is heated from the combustion going on in the lungs is mainly carried on by the agency of heat rendered latent. Thus fatty matter taken in the liquid form into the stomach, and conveyed unconsumed into the extreme parts of the circulation, in being deposited there yields up an equivalent of not less than 162° of heat. Thus water, which, as the grand menstruum of the solids, must be protected from losing its heat of fluidity, is so protected by the saline substances and the albumen that it cannot be solidified even locally at any temperature above 16° Fahrenheit. Thus, and lastly, for the present occasion, by their capacity for taking up the heat of fluidity and for yielding that heat up again, the blood corpuscles become the great carriers of that caloric of the body by which all the soft parts hold and maintain their mobility and physical activity.

"But in order that the blood corpuscles should be subjected to the influence of living combustion in the lungs, they must be brought over the pulmonic circuit in proper mechanical suspension—in other words, in a state of proper distribution; and this obtains so long as they are borne in the fibrin of the liquor sanguinis, the fibrin itself being diffused equally through the homogeneous fluid of water, saline matter, and albumen, which we call serum. The moment, therefore, there is separation of water from albumen, the moment the balance of water, albumen, fibrin, and blood corpuscles is disturbed by the separation and abstraction of water, that moment the blood corpuscles cease to be brought correctly to the lungs to fix caloric. As a result, there is a reduction in the amount of the caloric of fluidity that should be conveyed to the tissues, and then every ounce of water, beyond what is natural, that is conveyed from the organism carries away so much caloric at the expense of so much tissue. In fact, if it were not for the capacity of the water to abstract caloric from the tissues so as to maintain its own fluidity, the water of the tissues of the cholera patient would fall so rapidly that death would almost be instantaneous on the destruction of the homogeneousness of the blood.

"PHYSIOLOGICAL TREATMENT OF CHOLERA.—The inadequacy of all the forms of empirical treatment of cholera is so manifest

that there is no need for apology in offering what seems to be the most reasonable line of treatment on a physiological basis. I only hope the simplicity of the suggestions which physiology at present offers may not be prejudicial to its teachings.

"According to our lights, on the basis stated, there are three lines of practice open in cholera:—

"1. To arrest elimination.

"2. To supply the caloric of fluidity.

"3. To restore the homogeneousness of the blood.

"If we could see a certain and simple way of restoring the homogeneousness of blood we should have in our hands an immediate antidote to cholera, and the third suggestion would become the first and only suggestion. Unfortunately, we have yet, by continued experiment, to learn this antidote, and we must, as a consequence, reserve the trial of it for the extreme stages of the disease—a last resource.

"To fulfil the first of these indications—viz: to arrest exudative discharge—there are only two sets of remedies known: opium, which acts, when it can be absorbed, on the involuntary nervous system, producing contraction of capillary vessels of the alimentary surface (in the same manner as it produces contraction of the pupil); and direct local astringents, which act on the secretions of the canal, viz: creasote, tannin, the mineral acids, and some metallic salts. It must be clear that none of these are curative remedies in the extreme sense of the term—that is to say, they are not direct remedies or antidotes for the primary derangement. But by their astringent action they prevent the water of the body from being conveyed away, and in this sense they conserve the animal caloric represented in the water, and which is absolutely lost when the water actually flows from the organism. Remedies of the class named are, consequently, of the utmost service, especially in the earlier stages of the malady. From a good experience of the disease in the two last epidemics, I infer that the combination of opium with one or other of the local astringents named is the best practice, and I should place the following combinations in the order in which they are most effective: Opium and creasote; opium and a mineral acid; especially sulphuric or nitrous acid; opium and tannin.

"To fulfil the second indication to sustain the caloric, there are two methods open. One of these is to prevent, as far as is possible, the radiation of sensible heat from the body. The cholera patient should be treated in the same manner as a man who is exposed to extreme coldness of the air. His animal fire low, and the conveyance of caloric in his system interfered with, the choleraic sufferer is the parallel of an Esquimaux exposed without shelter to polar air and deficiency of food. To expose a man reduced in temperature to any process that shall remove from him caloric, is contrary to all reason; to give him the advantage of the hot bath and to maintain his temperature by efficient clothing is the most natural, as it is the most obviously useful procedure. One has only to see a few times how the physical forces of life improve when the patient, collapsed and cold, temporarily rallies in the hot bath, to be assured of the soundness of the practice. This, however, is not again a curative process in the direct sense, but conservative only; for the body, by its external surface, cannot absorb caloric unless there be actual destruction of its surface.

"It has been suggested to attempt the introduction of heat by subjecting the patient to heated air for inhalation. In this way, in health, there is no doubt a large proportion of heat can be introduced; but in cholera, where the homogeneousness of the blood is lost, the conditions for the absorption of heat are absent, and while a low temperature of air would be mischievous, a very high temperature would, I fear, do no more than tend to cause dryness of surface from further loss of water by the pulmonic textures.

"It is still a desideratum to supply animal caloric, and this, I would point out, may be accomplished to a marked degree by attention to the fluids which are given as drinks to choleraic patients. I am bound to denounce as utter folly, and almost worse, the practice of charging such patients with cold and iced drinks. Presuming that a choleraic sufferer is just sustaining his natural caloric at 96° Fahr., he does this by the gradual consolidation of his tissues and the giving up from them of their heat of fluidity. At this stage let there be given to him a pint of fluid at 40° Fahr., and straightway from an equal weight of his body, there is extracted by equalization

28° Fahr. of caloric, which, as he is placed, will never again be applied for the production of force.

"This plan of cooling down a cooling body is, according to my estimate, adding evil upon evil. To treat the disease rationally, the reverse principle ought to be invariably carried out; that is to say, foods and drinks should be made the means for introducing heat abundantly. It seemed to me, on this reasoning, to be an important point to produce a substance which shall, as a liquid food, supply tissue material and with that heat.

"Taking advantage of the fact that crystallizable fat, when mixed with albumen, can be dissolved by the heat of water, which heat it fixes in becoming soluble, and gives up again on solidifying—I set to work to produce a food having the properties named. After numerous attempts the following proves most successful:—

"Take of pure stearine two ounces by weight; of best fresh butter, two ounces; of whites and yelks of eggs, well beaten up, eight ounces; of carbonate of soda, twenty grains; of chloride of sodium (common salt), eighty grains; of water, two ounces.

"As to mode of preparation for food. First dissolve, with heat, the stearine and the butter until they are both melted: then add the carbonate of soda and common salt to the eggs, and when these salts are dissolved in the egg stuff, mix it with the oily fluid, taking care that the latter is not of a temperature above 140° Fahr.; let the whole cool to a soft consistency, and finally on a slab or a board, rub in the water with a broad spatula. The compound may now be placed in a wide-mouthed jar; in a little time it settles into a moderately hard mass, and is ready for use.

"In administering this compound to the sick, take one ounce, or a tablespoonful; place it in a large breakfast cup, and rub it up equally with a teaspoonful of glycerine, or a teaspoonful of ordinary water, or a teaspoonful of fine sugar and water, or a teaspoonful of honey and water. Next pour upon the mass three ounces of water, *actually boiling*, and incorporate well. The solid substance will now briskly and evenly dissolve, and will be at once so cool that it can be drunken. The thermometer plunged in it will only register from 130° to 135° Fahr. In this process the heat of the boiling water has been mainly (allowance must be made for conduction and radiation) expended in rendering fluid the solid matter. We may estimate safely, that in addition to the sensible heat, 44° have been rendered latent for every ounce of fluid at least, which heat will be yielded up to the tissues if the fluid make its way into them.

"Contrasted with the supply of a pint (pound) of ordinary water at 40°, a pint of this fluid would effect a difference equal to 204° of added heat to a pound weight of the substance of the organism.

"I may add that the fluid food prepared as proposed above is very agreeable to the taste, and that it may be made the vehicle for conveying either solution of opium, creasote, or dilute sulphuric acid, in proper doses. I found after taking nine ounces of the fluid no sensation of nausea or uneasiness, but in the course of half an hour, the surface of my body became very hot, and the heat increasing remained unpleasantly high for several hours. For patients who would object to drink the fluid while heated, it might be allowed to cool ten or even twenty degrees. A glass of port wine is easily miscible with four ounces of the fluid.

"The last indication of treatment is to endeavour to restore the homogeneousness of the blood, and to bring the red corpuscles into proper circulatory action. This can only be effected by injection direct into the veins, and we know from experience that in the last stages of collapse the injection of certain fluids into the veins has been attended by remarkable results: the collapse has, for the time, ceased, and, in some instances, the appearances of recovery have been so decided that the most sanguine but delusive hopes have been raised. In a case which I attended with the late Mr. Ancell, of Norfolk-terrace, during the epidemic of 1853–4, we injected into the veins of a collapsed woman two pints of warm saline water four successive times, and each time with the effect of restoring her to consciousness and power of movement, thus evidently extending her life over a space of thirty hours.

"Facts such as these have been recorded by many other authors, and the effect of the experience has been to render the idea of 'transfusion,' as it is called, very popular with members of the profession, who, seeing its promise, have hoped for it more

than they have positively realized. The great question to be settled is: What fluid shall be injected? Blood has been injected and has failed; milk has been injected, and has usually failed; saline solutions have been injected, and have, as a general rule, failed; simple warm water has been injected, and has, in its turn, failed. In short, none of these solutions have been potent in saving life, but one and all of them have, for a time, averted death.

"The reason why certain immediate but not lasting benefits have followed these various injections is, that they have always been injected after being heated up to blood heat; the caloric thus supplied has been the underlying basis of the transient success. Any experimentalist can prove this by injecting the solutions into the systems of animals recently killed; he will find himself able to reproduce muscular contraction with the solutions named, equally well with each, if they are heated to the same degree, *i. e.*, from 106° to 115° Fahr.; he will find them all equally negative, if they are not thus raised in temperature. Hence we must consider the question of transfusion in a new light, or success from it will continue to be only temporary.

"In respect to transfusion in the collapse of cholera, there is as little difficulty in accounting for the ultimate failure of the proceeding, as for the temporary success. The success depends on the infusion of caloric, the failure on the inability of the fluids injected to sustain the calorific activity.

"*Blood* is not the proper fluid, however neatly it may be defibrinated, because, in the system of the choleraic patient, there is no deficiency of corpuscles nor of hæmatin, neither of which have escaped from the body; in addition, no sufficient quantity of human blood could be obtained for the purposes of injection; the mere injection of a pint or a quart of fluid is a bagatelle: what is wanted to inject is many quarts of fluid; what is wanted to be done is, to *feed* by the veins, not to fill them once and no more, with a limited change of material.

"*Milk* is indifferent because it does not combine readily with the blood in the tissues, and because it coagulates and speedily decomposes.

"*Saline solutions* combine with the blood remaining in the tissues, but they do not sustain, and they cause great shrinking of the corpuscles.

"*Water* simply conveys sensible caloric, it does not sustain; it dilutes the residual blood too freely, and ultimately, as it cools, it removes caloric from the structures with which it comes in contact.

"What then do we want in the way of a fluid? I have thought that the fluid should contain digested and easily hydrating albumen; fatty substance that would solidify at a low temperature a small quantity of saline matter, and a substance that will easily pick up the blood corpuscles, when they have been partially deprived of fluid, and restore them to their natural form and character. I have set myself to work upon drying blood to test for such a fluid, and at last have arrived at the following formula, which, on blood out of the body at all events, answers the purpose well. I give the proportions for a pint of fluid.

"Of white of egg take 4 ounces by weight; of common salt, 1 drachm; of carbonate of soda, 1 scruple; of clarified animal fat, 1 ounce; of pure glycerine, 2 ounces; of water, sufficient to make 1 pint. In preparing dissolve the common salt and carbonate of soda in the water, and having well whipped the albumen, add that also to the water. Place the mixture on a water bath, and raise the temperature to 135°; keep the mixture steadily stirred and digest at this temperature for one hour. This constitutes an artificial serum, the albumen of which hydrates freely. Having taken the artificial serum off the bath, place the fat and the glycerine together in a crucible, and melt the fat in the glycerine. When the process of solution of fat is complete, pour the solution into the artificial serum at or about 120°, and stir in carefully; set aside that the fluid may cool to 80° Fahr, at which point all the fat that is insoluble at 80° will float on the surface, take this off and filter through coarse paper or closely woven cloth.

"The fluid thus obtained is of pinkish colour, of alkaline reaction, of saline sweetish taste, and of specific gravity 1038. It picks up semi-fluid blood with instant readiness, and diffuses it most equally. Heated, it takes up one-third more caloric than does water in the same time, and in cooling it restores nearly one-third more.

"From my experience with mere saline injections I infer that the fluid might be injected, at a temperature of 106°, into the veins of a collapsed adult, in the proportion of two pints at one time.

"I have one word to say in reference to the

mode of injecting the veins. The greatest mischief has arisen in transfusion, from errors in the operation. The operator should ever remember that in this process he is feeding, not forcing; he should keep in mind how gradually nature feeds the veins by the thoracic duct, and he should imitate her; there is no necessity for force, none for hurry.

"Above all things, in feeding by the veins the syringe should be thrown aside; it is a dangerous, bad instrument for the purpose. To replace it I have constructed a simple instrument, which I have used with great success."

This instrument could not be well understood without a figure, and this we could not have prepared in time for this number of the Journal.

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Origin, Cause, and Prevention of Cholera.—At a late meeting of the Epidemiological Society, Dr. Richardson expressed the following views:—

"The positions he is prepared to maintain in respect to the cause of cholera and its propagation may be summed up as follows:—

"The cause of cholera lies outside the organism.

"The cause, when once in operation, can be carried from place to place.

"It can be carried in clothing or on any solid substance. As dried scale, it may possibly be wafted a few feet by the air; but the great medium for its diffusion is water in fluid or vapour.

"The poison thus set in motion increases in the bodies of infected persons, but only in the alimentary canal.

"The evidence is all to the effect that the poison escapes from the bodies of the infected only from the alimentary system.

"The evidence points directly to the fact that in all cases of infection the poison is always, and only, received by the alimentary canal.

"After the close of the Crimean campaign the council of the Epidemiological Society issued a series of questions to the officers of the Black Sea fleet in relation to the epidemic of cholera that prevailed in the fleet during the occupation.

"At the time of the outbreak of the cholera the population of the fleet numbered 12,572 men, these men all living under the same conditions, except in one particular, yielded 710 cases of cholera, and 397 deaths. Of these cases in the gross 91.26 per cent. of the men attacked were supplied with water derived from springs at Baltschick, a spot on which French troops had been quartered while suffering from cholera; the troops had washed their clothing at these springs, and the ground for a great distance around was saturated with their excreta. The remaining 9.74 per cent. of the infected were supplied with water partly from Baltschick. Three other crews of vessels suffered from severe diarrhœa, and of these two positively took in water from Baltschick, and the third probably so. In one vessel which used distilled water, water condensed from the steam of the engines, cholera broke out, a circumstance which might at first sight appear to go against the water dissemination theory; but on examination it turns out that this water was passed to the tank through a foul hose pipe, by which it was made impure. In all the other ships supplied with distilled water not a case occurred. The contrast is most striking; an experiment, devised for the direct determination of the truth, could not be more demonstrative.

"The evidence is not less conclusive when we pass to the facts which bear on the progress of the disease amongst the officers and men of infected vessels. I find that the officers in such ships were attacked in the proportion of 1 in 177, the men in the proportion of 1 in 16 29.

"Reading the narrative as it stands, I see no way in which to account for the comparative exemption of officers, except the very obvious one that the men, as a body, partook most freely of the infected water with which the ships were supplied without disinfecting it by heat. The officer took his wine, tea, or coffee, the sailor his grog. That the disease did not become distributed amongst the crews by mere personal contact with the infected is proved by the fact that in one ship several infected persons were removed, and that there was not a case of communicated disease amongst those who received them.

"Incidents not a few and of the most striking character stand out to attest the mode of propagation of cholera, and to prove that by water supply the disorder was most commonly reproduced. In Constantinople one of these signal evidences

was made manifest. Mr. Blogg, who was present during the worst of the epidemic, has been good enough to furnish me with a fact that came under his own direct observation. It was this: The wearing apparel, the bedclothes, and the mattresses of the sick were washed at one of the fountains of the city in the neighbourhood of Tavatola. The waste pipe of the fountain being broken, this foul water became mixed with the drinking water of Tavatola. In one day after this event sixty persons in the small district supplied from this foul water were stricken with the malady

"In Paris, if all the facts had been published, similar truths were laid open; and one enterprising and eminent physician—Dr. Vacher—was so clear in his views on this subject that he wrote to the Administration, begging to have water from the public reservoirs that he might determine the organic impurity. The authorities, knowing necessarily what the disclosure would be—well aware, in fact, that the water of Paris was poisoned with organic matter derived from sewage—refused, in a tone of the most peremptory kind, this simple request.

"Snow did not sufficiently recognize that the vapour of water was an active means of conveying the choleraic poison. This truth, however, has been abundantly proved since his death. My friend Mr. Watkins, of Towcester, has shown, in a paper marked by singular acuteness of observation, that in the last epidemic which occurred in his district the persons most constantly and fatally attacked were the women who washed the clothes of the sick. This circumstance, which has been largely confirmed by other observers, is almost a necessary occurrence. Unless every portion of the garments washed were actually exposed to 212° Fahr. instantaneously, the organic poison would (at lower temperatures) begin to pass off with the vapour, and those exposed to the vapour could only escape, I had almost said, by accident.

"Snow, again, did not recognize the escape of the poison from the infected body directly in the form of water vapour. This is a point of the greatest importance, because it determines the dissemination of the poison to a considerable degree. Thus when the temperature of the air is low, the fluid excreta condense on the body or on the clothing, and the poison is confined and limited in its effect; but when the temperature is raised, the poison disseminates readily in the vapour of water from the fluid exhalations. This is, I believe, without any further mystery, the reason why cholera always spreads most easily when the temperature is moderately high.

"And for the same reason cholera spreads most easily in crowded rooms. In these rooms the temperature is artificially raised, and hot fluid foods, prepared often in the rooms, and always introduced into them, surcharge the air with moisture and heat. In such an atmosphere the poison of cholera in vapour of water finds an equable and easy surface for distribution, vapours acting virtually as vacua the one to the other.

"Once more, in modification of Snow's view respecting the propagation of cholera, I think that larger experience, from the time he moved amongst us, has shown that the dried choleraic matter deposited in infected clothing may be carried further and more readily than he supposed.

"Lastly, we may perhaps with some fairness believe that he urged rather too strongly the idea that the choleraic poison is often conveyed on the hands of attendants, or on utensils that have received choleraic excreta.

"It will be well remembered in this place that our distinguished colleague held to no point so tenaciously as the non-spontaneous origin of what he called the 'cholera cell.' This was a perfectly natural position for him to take, because in his time the germ or cell theory of disease was predominant, and because no suspicion even had been offered that organic poisons, or rather poisons derived from organic animal substances, could take any except the cell form. This being the prevailing thought, the question of the origin of the assumed cholera cell merged into the question of the spontaneous generation of organic cells altogether; and as the universal evidence was opposed to spontaneity, Snow, with the rest of the thoughtful of his compeers, held that the cholera cell always demanded for its reproduction a pre-existing cell.

"In this particular I believe him to have been incorrect, not from opposition to the truth, but from his wanting possession of those advances in physical medicine that have been made since he died.

"An observation made originally by

myself last year on the nature of the poisonous product of pyæmia throws a new and simple light on this question of the origin of organic animal poisons. In experimenting with the albuminous exudative matter derived from the diseased open surface of a patient suffering from pyæmia, I found that the poisonous matter presented the characters of an alkaloid. I learned that it was derived from the decomposition of albuminoid substance; I marked it as an 'animal alkaloid,' I named it 'septine,' and I showed that by its mere presence on a secreting surface it transformed albuminous secretion into matter like unto itself.

"These researches on the existence of an alkaloid occurring in the body during disease have been this year singularly confirmed physiologically by Dr. Bence Jones's discovery of an alkaloid natural to the tissues which is also derived from albumen, and which he has named quinoidine.

"With the facts before us that from albumen organic alkaloidal poisons can be formed by mere physical change of elements, the hypothesis of the necessity of cell growth for the production of organic animal poison falls to the ground. We need not now enter on the question of spontaneous generation at all; the formation of the poison, although from organic substance, has nothing to do with the origin of life; the poison is a purely chemical change of organic substance; a resolution rather than a construction; a movement from the active or vital towards the inert or dead condition of matter.

"In respect to cholera, the view that the poisonous matter is in the excreta in the form, not of an organic cell, but of an organic animal alkaloid, makes what was before difficult perfectly simple. As the exuded or excreted matter from a wounded surface can, and does—under certain conditions of oxidation which we have yet, by a few simple experiments, to learn—produce pyæmic poison, so the excreted matter from the alimentary canal is equally capable, under peculiar conditions of oxidation, of producing an alkaloidal organic poison, which, soluble in water, but admitting of deposit on desiccation, passes easily from one person to another under the agency of those physical states which we have seen as peculiar to the development and progress of the epidemic."—*Med. Times and Gaz.*, July 28, 1866.

Report of the Cholera Conference at Constantinople.—[The editors of the *Boston Med. and Surg. Journal* have been fortunate enough to obtain an early copy of this report, which makes a pamphlet of 83 pages, and in their No. for Aug. 9th they have given an abstract of it, which we transfer to our pages, cheerfully acknowledging our obligations to them. This important document exhibits the results of the mature deliberations of the conference, which was nearly two months in session.

The Commission was divided into six sections, to each of which questions were distributed for consideration; and the answers then submitted for adoption by the whole Commission.]

First Group of Questions—the Origin and Genesis of Cholera; the Endemic and Epidemic Prevalence of this Disease in India.—I. Whence did the cholera, called Asiatic, originally come? And in what countries does it exist in our day in an endemic form?

The Commission with one voice is able to answer without hesitation that the Asiatic cholera, which at different times has run over the whole world, has its origin in India, where it had its birth, and where it exists permanently as an endemic.

Adopted unanimously.

II. Out of India, does the Asiatic cholera exist in our day in any part of the world in an endemic form?

The Commission considers as demonstrated that the Asiatic cholera, wherever it appears, is never spontaneously developed and has never been observed as an endemic (care must be taken to distinguish secondary foci, more or less tenacious in their character) in any of the countries which have been enumerated (Europe, &c.), and that it has always come from abroad. As for the countries in the neighbourhood of India, while admitting it as probable that the cholera does not exist there as an endemic, the Commission does not feel itself authorized to come to any formal conclusion on the subject.

Adopted by all the members of the Commission, except MM. Polak, Sawas and Van Geuns.

III. Is there any reason to fear that the cholera may acclimate itself in our countries?

The Commission, without rejecting the

possibility of the fact, regards it as problematic.

Adopted unanimously.

IV. Is there in the Hedjaz an original focus of cholera, permanent or periodic?

The Commission is of opinion that Asiatic cholera does not appear to have had in the Hedjaz its original focus, but it appears to have always been introduced there from abroad up to the present time.

Adopted unanimously, except by M. Goodeve.

V. Are there in India certain localities which have the exclusive privilege of generating cholera, or which are more particularly favourable* to its development? In other words, is cholera endemic in all parts of India, or only in certain regions which it is possible to circumscribe?

At this time the Commission can only answer that there are in India certain localities, comprised principally in the valley of the Ganges, where cholera is endemic, without being able to point out all of them, or to affirm that they have the exclusive privilege of giving birth to this disease.

Adopted unanimously.

VI. Do we know the causes by the concurrence of which cholera originates spontaneously in India, as well as the circumstances which make it take on an epidemic character?

The Commission feels obliged to limit itself to answering that we know not the special conditions under the influence of which the cholera breaks out in India and reigns there in certain localities as an endemic.

Adopted unanimously.

VII. What are the circumstances which concur in the development and the propagation of epidemics of cholera in India?

The Commission believes itself authorized in answering, that pilgrimages are in India the most powerful of all the causes which tend to develop and propagate cholera epidemics.

Adopted unanimously.

SECOND GROUP OF QUESTIONS—THE TRANSMISSIBILITY AND PROPAGATION OF CHOLERA.—VIII. Is the transmissibility of cholera proved to-day by facts which do not admit of any other interpretation?

Do not all these facts demonstrate conclusively that cholera is propagated by man, and with a rapidity in proportion to the activity and rapidity of his own movements? The Commission does not hesitate to answer in the affirmative.

Adopted unanimously.

The Commission, with unanimity, concludes that the transmissibility of Asiatic cholera is an incontestable verity, proved by facts which do not admit of any other interpretation.

Adopted unanimously.

IX. Are there conclusive facts which force us to admit that cholera can propagate itself at a distance by certain atmospheric conditions, by winds, or by any other change or modification of the surrounding medium?

The Commission answers that no fact has proved, up to the present time, that cholera can propagate itself at a distance by the atmosphere alone, whatever may be its condition; and that besides it is a law, without exception, that never has an epidemic of cholera extended from one point to another in a shorter time than was necessary for man to carry it.

Adopted unanimously.

X. How is the importation of cholera effected, and what are the agents of its transmission?

It may be said, without more specific statement for the moment, that if all modes of conveyance from countries affected with cholera are not likely to propagate the disease, it is none the less prudent, at present, to consider all such means of conveyance as suspected. A more detailed examination will settle the question.

Adopted unanimously.

XI. Under what conditions does man import the cholera?

Man affected with cholera is himself the principal propagating agent of this disease, and a single cholera patient may cause the development of an epidemic.

Adopted unanimously; and—

XII. The Commission has been led to conclude that certain facts tend to prove that a single individual (with much greater reason many individuals) coming from a contaminated place, and suffering from diarrhœa, is able to cause the development of a cholera epidemic; or, in other words, that the diarrhœa called premonitory is able to transmit cholera.

Adopted unanimously.

XIII. What is the period of incubation?

In almost all cases the period of incubation, that is to say, the interval between

the moment when the individual may have contracted the cholera poison and the commencement of the premonitory diarrhœa, or of confirmed cholera, does not go beyond a few days; all the facts cited of a longer incubation belong to the class where the contamination may have taken place after departure from the infected place.

Adopted unanimously.

XIV. Can the cholera be imported and transmitted by living animals?

There is no known fact which proves that cholera has been imported by living animals; but it is reasonable, nevertheless, to consider them, in certain cases, as belonging to the class of objects called susceptible.

Adopted unanimously, except by MM. Bykow and Lenz.

XV. Can cholera be imported and transmitted by linen, clothing, and in general by articles in common use?

Cholera can be transmitted by articles in common use coming from an infected place, and especially by those which have been used by cholera patients: and it also results from certain facts that the disease may be transported to a distance by these same articles when closely shut up from the outer air.

Adopted unanimously.

XVI. Can cholera be imported and transmitted by merchandise?

The Commission, while admitting with unanimity the absence of proof of the agency of merchandise in the transmission of cholera, admits (by a majority of 16 votes to 6) the possibility of the fact under certain conditions.

The negative votes were those of MM. Bykow, Goodeve, Lenz, Pélikan, Polak, and Van Geuns.

In consequence, until more fully informed, the Commission believes that it will be wise to consider as suspected, at least under particular and determined conditions, everything coming (*toute provenance*) from a cholera district.

Adopted unanimously, except by MM. Goodeve, Pélikan and Polak, who declined voting.

XVII. Can the bodies of patients who have died of cholera import and transmit the cholera?

Although it is not proved by conclusive facts that the bodies of patients dying with cholera can transmit the disease, it is prudent to consider them as dangerous.

Adopted unanimously, except by M. Sawas, who declined voting.

On the Influence of Means of Communication.—XVIII. What influence do the various modes of communication, whether by land or sea, have upon the propagation of cholera?

The Commission answers, that maritime communications are by their nature the most dangerous; that it is they which propagate most surely cholera at a distance, and that next to them comes communication by railroad, which in a very short time may carry the disease to a great distance.

Adopted unanimously.

XIX. What is the influence of deserts upon the propagation of cholera?

The Commission, resting upon facts established by experience, concludes that great deserts are a most effectual barrier to the propagation of cholera, and it believes that it is without example for this disease to be imported into Egypt or Syria, across the desert, by caravans from Mecca.

Adopted by all the members of the Commission except MM. Monlau, Pélikan, Polak and Van Geuns, who declined voting.

The Influence of Crowding.—XX. What is the influence of crowds upon the intensity of epidemics of cholera, as well as upon the propagation of the disease? and under what conditions does it exercise its influence?

All crowding together of human beings, among whom cholera has been introduced, is a favourable condition for the rapid spread of the disease—and, if this crowding exists under bad hygienic conditions, for the violence of the epidemic among them.

In this case the rapidity of the extension of the disease is in proportion to the degree of crowding, while the violence of the epidemic is, other things being equal, so much the greater according as individuals have been little exposed to the choleraic influence or not at all; that is to say, in other words, individuals who have already been exposed to the influence of a cholera atmosphere enjoy a sort of relative and temporary immunity which counterbalances the bad effects of crowding.

Finally, in the case of a dense crowd,

the more rapid its separation, so much the more rapid is the cessation of the epidemic, at least if new arrivals of unaffected persons do not furnish new aliments for the disease.

Adopted unanimously.

XXI. What is the intensity and what the tenacity of cholera epidemics on shipboard?

The Commission replies that the intensity of cholera on board ships crowded with men is, in general, proportionate to the crowding, and is so much the more violent, other things being equal, if the passengers have not resided in the focus of cholera from which they started; that on crowded ships the spread of cholera epidemics is ordinarily rapid; finally, the Commission adds that the danger of importation by ships, and that of giving rise to a grave epidemic, are not entirely subordinate to the intensity, nor even to the existence of choleraic symptoms appearing during the voyage.

Adopted unanimously, except by M. Monlau, who declined voting.

XXII. What influence does the accumulation in lazarettos of individuals coming from a cholera district exercise upon the development of cholera among the people at quarantine and in the neighbourhood?

The Commission concludes that the crowding together of people coming from a place where cholera reigns in a lazaretto, has not the effect of producing, among the people at quarantine, a great extension of the disease; but that such a gathering is nevertheless very dangerous for the neighbourhood, as it is calculated to favour the propagation of cholera.

Adopted unanimously, except by M. Monlau.

XXIII. What influence do great collections of men, in armies, fairs, pilgrimages, exercise upon the development and propagation of epidemics of cholera?

The Commission concludes that great gatherings of men (armies, fairs, pilgrimages) are one of the most certain means for the propagation of cholera; that they constitute the great epidemic foci which, whether they march after the manner of an army, or whether they are scattered, as at fairs and in pilgrimages, import the disease into the country which they traverse; that these gatherings, after having been exposed, usually in a rapid manner, to the influence of cholera, become much less susceptible to its power, and that it disappears very speedily, unless newly arrived persons take the disease.

Adopted unanimously.

XXIV. What is the influence of dissemination upon the intensity and development of cholera epidemics?

The Commission concludes that the breaking up of a collection of people, at an opportune time, may render less violent an epidemic of cholera and even arrest its extension; but that this scattering, on the other hand, gives rise to great danger of propagating it, if it take place in the midst of a region as yet unaffected.

Adopted unanimously.

XXV. What part belongs to the pilgrimage to Mecca in the cholera epidemics of our day?

The part of the pilgrimage to Mecca, as an agent in propagating cholera as regards the neighbouring countries of Europe (the only one with regard to which we have positive information) has been the introduction of this disease into Egypt twice, with an interval of thirty-four years, during the hot season.

Adopted unanimously, except by M. Polak, who declined voting.

THE INFLUENCE OF HYGIENIC CONDITIONS.—XXVI. What is the influence upon the violence of cholera epidemics exerted by hygienic and other conditions of locality; in other words, what are the assisting causes of cholera?

The Commission recognizes that the hygienic and other conditions which in general predispose a population to contract cholera, and consequently favour the intensity of epidemics, are: misery, with all its consequences; overcrowding, particularly of persons in feeble health; the hot season; want of fresh air; the exhalations from a porous soil impregnated with organic matters, above all with the dejections from cholera patients.

In addition, the Commission think that, as it appears demonstrated by experience that the discharges of cholera patients contain the generative principle of cholera, it is right to admit that drains, privies, and the contaminated waters of towns may become the agents for the propagation of this disease.

The Commission adds, that it seems to result from certain facts that the soil of a locality, once impregnated with cholera de-

tritus, is able to retain for a considerable length of time the property of disengaging the principle of the disease and of thus keeping up an epidemic, or even of regenerating it after it has become extinct.

Adopted unanimously, except by M. Pélikan.

IMMUNITY FROM CHOLERA.—XXVII. How is immunity from cholera to be interpreted?

The immunity which certain localities enjoy, that is to say, the resistance, permanent or temporary, general or partial, opposed by these localities to the development of cholera within their limits, is a fact which does not exclude transmissibility, but which indicates that certain local conditions, not yet entirely determined, are an obstacle to the development of the disease.

The same immunity, more or less complete and more or less durable, which the majority of persons in the midst of an infected district enjoy, an immunity which attests the individual resistance to the toxic principle, is a circumstance to which we should attach the highest importance.

In point of view of epidemic development, it is the corrective of transmissibility, and viewed with regard to prophylaxia, it sets in operation proper means to arrest the ravages of the disease.

Adopted unanimously, except by MM. Monlau and Pélikan, who declined voting.

DEDUCTIONS RELATIVE TO THE GENERATIVE PRINCIPLE OF CHOLERA.—XXVIII. From the facts above established, and which relate to the genesis, the propagation and the transmissibility of cholera, can we draw any precise conclusion with regard to the generative principle of the disease, or at least with regard to the media which serve as its vehicles, or receptacles; with regard to the conditions of its penetration into the organism, the ways by which it passes out, the duration of its morbific activity, in a word, with regard to all its attributes, a knowledge of which is important to guard against it?

In the actual state of science, we can only frame hypotheses as to the generative principle of cholera; we know only that it originates in certain countries of India, and that it dwells there permanently; that this principle is reproduced in man and accompanies him in his journeyings; that it may also be propagated at a distance, from place to place, by successive regenerations, without ever being reproduced spontaneously outside of man.

Adopted unanimously, except by M. Goodeve, who declined voting.

XXIX. What are the vehicles of the generative principle of cholera?

Under the name of vehicles, the Commission intends to speak merely of the agents by means of which the morbific principle penetrates the organism. To this question the facts reply that the air is the principal vehicle of the cholera principle. . . . . The action of the cholera miasm is so much the more sure as it operates in a confined atmosphere and near the focus of the emission. . . . . It seems that it is with cholera miasm as it is with the miasm of typhus, which rapidly loses its power in the open air at a short distance from its starting point.

XXX. To what distance from a focus of disease can the principle of cholera be transported by the atmosphere?

The surrounding atmosphere is the principal vehicle of the generative agent of cholera; but the transmission of the disease by the atmosphere, in an immense majority of cases, is limited to a space very near to the focus of emission. As for the facts cited of transportation by the atmosphere to the distance of one or more miles, they are not sufficiently conclusive.

Adopted unanimously, except by M. Goodeve, who declined voting.

XXXI. Independent of the air, what other vehicles are there of the cholera principle?

Water and certain ingesta may also serve as vehicles for the introduction into the organism of the generative principle of cholera.

This granted, it follows, so to speak, necessarily, that the passages by which the toxic agent penetrates into the economy are principally the respiratory passages and very probably also the digestive canals. As for its penetration by the skin, nothing tends to prove it.

Adopted unanimously.

XXXII. What are the principal receptacles of the cholera principle?

The matter of the cholera dejections being incontestably the principal receptacle of the morbific agent, it follows that everything which is contaminated by the discharges becomes also a receptacle from

which the generative principle of cholera may be disengaged, under the influence of favourable conditions; it follows, also, that the origin of the cholera germ takes place very probably in the digestive canal, to the exclusion, perhaps, of all other parts of the system.

Adopted unanimously.

XXXIII. What is the duration of the morbific activity of the generative principle of cholera?

It results from the study of facts that, in the open air, the generative principle of cholera loses rapidly its morbific activity, and that this is the rule; but that under certain particular conditions of confinement, this activity may be preserved for an unlimited period.

Adopted unanimously.

Finally, the Commission adopts the following formula:—

Observation shows that the duration of the choleraic diarrhœa, called premonitory—which must not be confounded with all the diarrhœas which exist during the time of cholera—does not extend beyond a few days.

Facts cited as exceptional do not prove that the cases of diarrhœa prolonged beyond that period belong to cholera, and are susceptible of transmitting the disease, when the individual affected has been withdrawn from all cause of contamination.

Adopted by fourteen votes against four, viz: MM. Gomez, Millingen, Mühlig and Salvatori; M. Monlau declined voting.

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Treatment of Cholera in the London Hospital.—It is stated in the *Lancet* (July 28th) "that during the previous week cholera had spread in a most malignant form over the east end of London, and with a severity not exceeded in any previous epidemic. As regards the treatment adopted, this has been of various kinds. Calomel in oft-repeated doses of twenty grains, astringents, stimulants, and hot vapour baths have been severally tried. Iced water *ad libitum* has been given in every case. In two cases injections of salines were thrown into the circulation, with the effect of producing immediate, but, unfortunately, not lasting, benefit. Transfusion of blood has been employed also in two cases with a similar result. It is a melancholy fact to record, but at the time of our last visit no case of undoubted cholera had recovered."

In the *Med. Times and Gazette* of the same date, we find some further details of the treatment which seems to be as purely empirical as ever.

Dr. Fraser said when the first case of cholera was admitted into the London Hospital "the inquiry that was forced upon him was, What are, if any, the new views as to the means of attempting to relieve the symptoms and obviate the tendency to death in this disease, more than were known during former epidemics? He admitted that no fresh practical means had been made known, and he said he entered upon his mission with feelings of deep depression, for his experience had shown him that no one drug or external appliance can be put down as the one thing to be given or to be done. He was sustained, however, by the knowledge that cases *have been*, as it were, snatched from the grip of death by various means, and held, therefore, that we are not to sit with folded hands, but to be up and doing all that science and common sense would dictate. Dr. Fraser, thus thrown back upon old resources, referred to certain papers published in the *London Medical Gazette* in 1848, where he had stated that five-grain doses of the sesquicarbonate of ammonia every hour were useful, and that the liquor ammoniæ itself internally acted as a most useful stimulant. 'Copious enemata of the chloride of sodium seemed in many cases to rouse the patient.' At that time he abjured, and further experience has made him continue to abjure, the use of opium, except in cases of what he calls spasmodic cholera. He wrote, 'I believe that when the patient is in a state of collapse opium is decidedly injurious.' In the former epidemic calomel in scruple doses was tried to a large extent, and with benefit in many cases. Transfusion of the following injection was practised in a few cases, and in one instance recovery was attributed to it: ℞.—Sodii chloridi ʒiij, sodæ carbonatis ʒij, aquæ lb. vj; two or three pints injected at a temperature of 112° Fahr. Dry frictions, and every other possible means of reproducing external warmth, were used.

"The foregoing, on the ground of having nothing new, have been the means up to this day more or less practised by Dr. Fraser at the London Hospital since this epidemic began, but with no greater success than

formerly; if anything, scruple doses of calomel seemed to have allayed vomiting more than anything else.

"The employment of warm brandy and water in many cases of partial collapse was of great benefit. Iced water, and ice in the mouth, are most agreeable to the patients. Saline injections and the injection of sheep's blood into the veins have been tried in former epidemics at the hospital. Enemata of warm brandy and water have seemed in two cases to be useful. The experience as yet will not warrant any general conclusions.

"The following is the plan Dr. Andrew Clark pursues; If on the admission of the patient there is incomplete collapse, and the stools are in any degree feculent, castor oil, with or without a few drops of laudanum, is administered at once. Generally, however, by the time the patient has reached the hospital, the stools have become abundant and watery, the temperature of the body has fallen, the pulse is feeble, and the limbs and face are getting blue. Astringents are then begun at once, and the patient gets either the 'lead pill' or Dr. Clark's astringent mixture, in doses and at intervals modified by the circumstances of individual cases. Each lead pill contains two grains of acetate of lead, two grains of camphor, an eighth of a grain of opium, and about a twelfth of a drop of creasote. The astringent mixture consists of aromatic sulphuric acid, sulphuric and chloric ethers, tincture of camphor and opium, spirits of peppermint, and decoction of logwood. The patient is put into a warm bath for half an hour or longer, and the bath is repeated after a few hours if there be need either for increase of temperature or absorption of fluid. Warm water, with or without salines, is also injected into the bowels. The patient is allowed milk or beef-tea thickened with any farinaceous fluid, and is directed to drink small quantities of iced water at short intervals. Turpentine is applied to the abdomen. Frictions are used for cramps. The bath is not employed when there is complete collapse. In earlier cases it gives great and prolonged relief. If vomiting is incessant and exhausting, it is treated with teaspoonfuls of neat or nearly neat brandy. When diarrhœa has ceased for twelve hours or more, a dose of castor oil and laudanum is given, sometimes preceded by a little gray and Dover's powders.

"During collapse the sulphuric acid mixture is given without opium; hot bags are placed round the body, and ice or iced water given as freely as it can be borne; warm water is injected into the bowels.

"During reaction, when the tongue is furred and eroded, the patient takes a chlorate of potash drink. Lung congestions and dyspnœa are treated by very small bleedings.

"It ought to be observed that Dr. Clark's plan is merely tentative. He, however, lays great stress on the free ingestion of fluid, the use of the warm bath, warm water enemata, and astringents in the early stage of the disease.

"At the suggestion of Dr. Markham, Dr. Hughlings Jackson begged Mr. Little to inject defibrinated and oxygenated blood in some cases of collapse of cholera. (See report of Dr. Fraser's remarks.) Sheep's blood was procured, the fibrin was removed by whipping; the blood was strained, and then kept to a temperature of 110° F. by placing the vessel containing it in hot water. About six ounces of this hot fluid was injected into the veins of two patients, but it relieved them only for a short time, and appeared to bring on dyspnœa. These patients, however, were extremely ill when the operation was done, and Dr. James Jackson tells us the plan can scarcely be said to have been fairly tried. It is difficult to fix on the right sort of case. It is not fair to try it on a patient who is recovering, and to inject a patient who is nearly *in articulo mortis* is scarcely likely to lead to any result.

"Dr. Herbert Davies has adopted a saline treatment. The following is the prescription for the draught: ℞.—Sodii chloridi gr xx, sodæ bicarb. gr. xv, potassæ chloratis gr. x, aquæ ℥j. as frequently as they will take it. The patient has, besides, as much water as he can drink.

"One physician whom we met at this hospital said that if he had to treat a case of cholera he should inject quinia subcutaneously. The subcutaneous injection of atropine has also been suggested.

"The use of warm baths finds great favour. Every patient who is not in extreme collapse is placed in a hot bath, at a temperature of about 100° to 105° F. As a rule, Mr. Frederick Mackenzie tells us, the patients like the bath, and frequently beg for its repetition.

"The Resident Officers tell us that they are continually receiving accounts of 'infallible' remedies from zealous medical men who visit the cholera wards."

In the No. of the *Lancet* for Aug. 11th, it is stated that Dr. Fraser is now "trying at the London Hospital, the inhalation of steam in a few cases. For about a fortnight he employed frequent doses of castor oil—a tablespoonful every two hours. The remedy was very much disliked by the patients, who in several instances, Mr. F. Mackenzie informed us, positively refused to take it. No marked good results attended this treatment; and Dr. Fraser has since returned to the administration of calomel—a drug which is at least more easily taken by the patient and given by the nurse. To an adult he gives twenty grains to begin with, and ten grains every two hours, and so on in proportion to the age of the patient. Mr. Davies tried podophyllin and camphor, of each a grain every alternate hour, and a mixture of sulphuric and hydrocyanic acid in the intervals. He now employs calomel in five-grain doses at two hours' interval. Dr. Andrew Clark is trying castor oil, saline lemonade, and lead pill in patients admitted on different days, so that a certain number of patients are undergoing each kind of treatment. He gives baths, with Condy's fluid.

"In one case, four grains of camphor dissolved in twenty drops of turpentine was injected subcutaneously, every four hours, five or six times. The case was severe, and the man died. We observed one man who had gradually passed into a state of collapse after his admission into the hospital and whilst taking frequent doses of calomel."

At Guy's Hospital, according to the *Med. Times and Gazette*, Aug. 11, "Dr. Barlow treats cases in the stage of collapse, especially when vomiting is troublesome, by effervescing mixture, with two minims of hydrocyanic acid to each dose, every two hours. Besides this the patient is allowed to drink as much iced or cold water as he likes. Hot bottles to the feet are used in every case. Mustard poultices are applied to the epigastrium when the pain is intense. Dr. Owen Rees has tried inhalation of nitrous oxide in one case. A gallon of this gas was administered mixed with atmospheric air. This quantity was given at one dose on two occasions. The gas is put into a large elastic bag, to which is fixed an inhaler. It thus resembles Clover's chloroform apparatus. The case was a very bad one, and the patient died. In another case the same dose was given once; this patient was very bad when she was brought in, and she also died. In one case a gallon of half air and half oxygen was inhaled by a patient suffering from severe diarrhœa and vomiting. No perceptible effect was produced. This patient was admitted August 4, having then been ill a week. He is still in the wards, and is doing well. In two cases Dr. Rees directed the subcutaneous injection of Quassine. Thirty minims of a solution (containing two grains and a half of quassine) are injected into each arm every four hours. One of these patients, a man, died after eleven hours' illness. He died six hours after admission, and three and a half after the injection. This patient was almost pulseless and in extreme collapse when admitted. The other case, that of a woman, was a genuine case of cholera. Her temperature was 95° F. The solution was injected six times. She is now in the hospital, and it is hoped that she is doing well; but when we were last at the hospital (Wednesday morning), although her vomit was bilious, her motions fæcal, and although she had passed urine, her temperature was only 95°."

The editor of the *Lancet* may well remark (No. for Aug. 4), "We should feel little satisfaction at the progress of medical science if the treatment of cholera in some of our metropolitan hospitals were to be accepted as a fair example. To read the accounts collected by our reporter, and published in the *Mirror* of this and last week, is to feel that many of our hospital physicians are beginning in 1866, not where we left off in 1854, but where we began in 1849. It is melancholy to note the timidity—for it can be nothing else—which causes some physicians to linger still over the old notion that the more rapid and severe a disease shows itself, the 'stronger' must be the remedy. We find that drugs are still continued to be employed of which ample experience has shown the utter futility, and which are only prevented from destroying life because, happily, they are not absorbed—because, that is, they do not enter the economy, and cannot therefore act either for good or evil. We refuse to accept the treatment to which we have alluded as a

correct representation of the thoughtful medicine of this day. Should, unhappily, cholera spread to other parts of the metropolis, we count most confidently upon finding physicians with sufficient moral courage to abstain at least from the possibility of doing harm where the means of certainly doing good are not yet disclosed, and who will recognize the great responsibility incurred in ill-regulated, haphazard inflictions of 'treatment' upon a human body hovering on the verge of the grave. We protest against the employment of measures which seem to be directed against disease as though it were a conscious enemy, to be driven, washed, frightened, or poisoned out of the body, but which are utterly inconsistent with the whole spirit of modern medicine."

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Gason's Treatment for Cholera.—Mr. JOHN GASON recommends the following treatment of cholera: "The abdomen should be tightly swathed with a broad flannel binder sprinkled with chloroform, and the patient confined to the supine (horizontal) posture. As soon as the rice-water evacuations have commenced, and the fæcal evacuations have ceased, a tightly-rolled up towel, in length about eight or nine inches, and in circumference about three inches, and moistened with an antiseptic, should be placed lengthways beneath the buttocks, so that the orifice of the rectum may be about midway on the roller. No evacuation of the bowels should be permitted, which will be completely obstructed by the towel. Drinks must be strictly withheld until choleraic symptoms have passed. Some drops of chloroform should be given frequently on sugar during the stage of collapse. Opiates and stimulants are positively injurious, as they increase secondary fever."—*Lancet*, July 28, 1866.

[This reminds us of a suggestion gravely made by a late practitioner of this city, in 1832, that the anus should be securely closed with a soft cork so as to effectually restrain the alvine discharges, a proposal, we believe, actually carried out by some one abroad, whose name we have forgotten.]

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Roseola Cholerica.—It is stated (*Lancet*, July 28, 1866) that a rash has been observed to accompany the secondary fever of a certain number of cases of cholera. It has been mentioned by several English and continental authors, and is well described by Dr. Wilks in the Guy's Hospital Reports, third series, vol. iii. (1857). The roseola cholerica, as it is termed, exists in three varieties: 1, an eruption resembling roseola; 2, as smaller, more defined, and less vivid spots; 3, resembling scarlatina. The rash usually appears between the sixth and tenth days of the disease, but it is sometimes delayed much longer.

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Progress of Cholera Abroad. IN THE EAST.—There is now little doubt that cholera reappeared in May among the pilgrims assembled at Mecca towards the close of the religious ceremonies, and that it was very fatal in the caravan which proceeded to Medina. The disease cropped out in Jedda on the 23d of May among the Indians and lowest class of Africans—persons suffering the extremest privations. Eight deaths were officially reported between the 24th of May and the 3d of June, but more are believed to have occurred. Among the pilgrims assembled at Yambo the disease would appear to have broken out earlier, as 99 deaths were reported on the 26th of May. At this port a large body of the returning devotees were compelled to perform a species of quarantine—that is, they were not suffered to leave the place until they were considered to be purified from the epidemic. The resources of the town failed. Water and food became extremely scarce, and famine threatened to become more deadly than pestilence. Some 3000 of the pilgrims, either by force or with the connivance of the authorities, or from the insufficiency of the guard, contrived to reach the vessels in the harbor and sailed for Suez. The news of this breach of quarantine having reached Egypt, stringent measures were taken to compel the fugitives to land at some distance from Suez, and there complete the period supposed to be requisite for their purification. To the present time cholera has not reappeared (except in an occasional so-called sporadic case) in Lower Egypt; but the disease broke out in May at Massowa, on the Abyssinian west coast of the Red Sea.

Tiberias (pop. 3000), an excessively filthy town of Syria, was visited by cholera in November and December last year. On the 24th of May the disease appeared there again, and from that date to June 5th there were 54 deaths.—*Lancet*, July 28, 1866.

ENGLAND.—The number of deaths in *London* during the week ending July 28th, was from cholera 904, from diarrhœa 349; the whole number of deaths 2600. In the Registrar-General's report it is stated that the average number of deaths for that (the thirtieth) week of the year is, with a correction for increase of population, 1387. "The deaths in the present return exceed by 1213 the estimated number. The excess of deaths is caused entirely by cholera and diarrhœa. 904 deaths by cholera, 349 by diarrhœa, were registered in the week, making in the aggregate 1253 deaths. The deaths by cholera in the last five weeks have been 6, 14, 32, 346, and 904; by its allied disease diarrhœa 67, 102, 150, 221, and 349.

The Registrar-General's Report shows the deaths in London for the week ending Aug. 4th, to be cholera 1053, and 354 diarrhœa.

The *Lancet* in its editorial (Aug. 4) very justly remarks: "In the devastation which the cholera is working in the eastern districts of the metropolis, we are paying the dreadful price of local self-government by ignorant, careless, and unfit persons. The total neglect of sanitary provisions in the Poplar, Stepney, and Bethnal-green districts has been repeatedly and for years urged upon the attention of the local authorities. The miserable defects of water-supply and drainage, the loathsomeness of the closet arrangements, the accumulation of every kind of nuisance in a great number of our parishes have been suffered in spite of constant protests from medical officers and the public press, verdicts of juries, and recommendations of coroners. But what can be expected when local authorities are small tradesmen ignorant and supine, when the owners of the worst property have a predominant influence on the government of our parishes, and when boards of health and sanitary committees, vestries, and guardians can only be moved when cholera, long threatened and repeatedly announced, has forced the door and occupied every part of the place."

[We have repeatedly urged upon the people of this country to take a lesson from the dreadful effects of the neglect of sanitary measures abroad. The selfishness and avarice of property holders and the apathy and ignorance of the labouring classes, encourage the production of the same condition of things here. Evils which might be now prevented at a trifling cost, will hereafter, when once established, be only removable at an enormous expense, and after the most frightful loss of life, to say nothing of the loss of industrial labour which sickness entails.]

As the *Saturday Review* recently remarked: "When the public health is satisfactory, sanitary reform is naturally [held to be] rather a dull subject, and sanitary reforms run the risk of being voted at least equal nuisances with the abuses which they wish to get removed."

At *Southampton* cholera still prevails; the number of deaths up to the end of July was 101.

Liverpool.—The official *weekly* returns of deaths from cholera in this borough are as follows:—

Week ending July 7th,	4	deaths.
" 14th,	19	"
" 21st,	45	"
" 28th,	87	"

West of England.—Four deaths from cholera have occurred at *Sherbourne*. The disease made its appearance in a filthy locality, known as Cold Harbour, inhabited by very poor people, where the drainage is bad, and where the water supply is miserable.

Ireland.—Three deaths from cholera were reported in Dublin.

GERMANY.—The disease is still rife in Northern Germany. In *Berlin*, it is on the decrease, the number of cases has diminished from 200 to 139 daily. The whole number from the beginning of the epidemic to July 28, was 4401 cases of which 2338 died, 523 recovered, and 1540 were under treatment.

It is reported that the Prussian troops stationed near Brünn are sorely afflicted with cholera, dysentery, and typhus.

Dresden.—A few cases have occurred in this city.

At *Hamburgh*, there were from June 30 to July 26th, 156 cases and 98 deaths.

Holland.—The following are the number of deaths from the commencement of the epidemic up to July 25 in the chief towns—Amsterdam, 439; Leyden, 866; the Hague, 691; Delft, 389; Schieden, 221; Rotterdam, 945; Dortrecht, 347; Gonda, 129; Utrecht, 1365; and up to July 26, in Haarlem, 159; Kampen, 171; Meppel, 187; Groningen, 792.

Belgium.—The epidemic is still making considerable progress, affecting not only the populations of large towns, but those of small localities.

At *Brussels*. the disease has increased. The number of cases from July 4 to 18, at the two hospitals, St. Pierre and St. Jean, amounted to 224 with 107 deaths, besides between one and two hundred bodies brought to the *morgue* of the hospitals.

At *Antwerp*, from the commencement of the outbreak to the 25th of July, the number of cases was 2798, and of deaths 1564.

North of Europe.—The total number of cases in *Dantzig*, from the beginning of the outbreak to the 8th of July, was 332. In the week ending 26th of July the cases were 243, and the deaths 128.

In *Stockholm*, on the 5th of July, there were 5 deaths from the epidemic.

In *Stettin*, on the week ending July 18th, the number of cases was 399, of deaths 256. In the week ending July 26th, number of cases 300, deaths 211.

The Danube and Pruth.—Prior to the 13th of July cholera of a very malignant type was prevalent at Ismaïl, Ibraïla, and Galatz. The disease also was raging at the same time at Toultcha, Reni, Jassy, Bucharest, Grazova, and other towns, also in the villages along the course of the Pruth.

St. Petersburg.—From the commencement of the epidemic June 14th to the 14th of July, 1918 deaths were reported.

Cronstadt.—From June 14th, the onset of the epidemic, to July 12th, 244 deaths occurred.

Konigsberg.—July 31. About 1000 cases have occurred of which 600 have terminated fatally.

FRANCE.—It is impossible to ascertain the extent to which cholera prevails in *Paris*, since the authorities have absolutely prohibited all returns being published. According to the *Gazette Hebdomadaire* from the 17th to the 24th of July there were 679 deaths from the epidemic, but there is reason to believe that this is below the reality.

At *Marseilles* the deaths from cholera, from the 15th to the 22d July, both days inclusive, was 135.

Many localities in the *Département du Nord* have suffered.

The disease is prevalent among the towns and villages along the whole length of the river Lys. At Dunkerque there has been no death since the 3d of June. At Amiens the epidemic appears to be rapidly declining. On the 3d of July, 71 deaths were registered; on the 5th, 31; on the 6th, 40; and on the 12th the deaths had fallen to 14. At Paimbœuf the disease has broken out seriously. Bordeaux has come within the range of infection, and many deaths are reported. At Anvers the mortality had reached from 40 to 50 daily. The epidemic has also appeared at Rouen, Forges, arrondissement Rochefort (Charente Inférieure).

MEDICAL NEWS.

DOMESTIC INTELLIGENCE.

Progress of Cholera in the United States.—The present visitation of cholera has been with few exceptions a mild one. It has appeared at various points on the Atlantic coast and along the Mississippi and Ohio rivers, but its progress has been devious; many towns in its direct course being passed over; and its stay in most places has been shorter than usual.

New York.—The disease has greatly abated in the Islands in the bay. In the city of New York the deaths from cholera for the week ending August 4th, was 239; Aug. 11th, 250; Aug. 18th, 145; August 25th, 114. Deaths from all diseases, 714.

Brooklyn.—Deaths from cholera for the week ending Aug. 18th, 95; Aug. 25th, 65.

Philadelphia.—The disease still lingers here, though not very extensively, as will be seen from the following table showing the mortality from bowel complaints and all causes for the last four weeks:—

	Mortality in Philadelphia from						
	Cholera Infantum.	Diarrhœa.	Dysentery.	Cholera Morbus.	Cholera.	Total Bowel Affections.	Total Mortality from all diseases.
1866.							
Week ending Aug. 4,	106	19	12	26	47	210	504
" " " 11,	73	11	17	24	52	177	471
" " " 18,	77	6	24	16	56	179	435
" " " 25.	61	23	24	15	91	214	462

Cincinnati.—The disease has prevailed there to a considerable extent, as is shown by the following statement of deaths from it for several days: August 16th, 78; Aug. 17th, 64; Aug. 18th, 69; Aug. 19th, 54; Aug. 20th, 61, Aug. 21st, 53; Aug. 22d, 33; making a total for seven days of 412.

St. Louis.—This city has suffered more from the scourge than any other in this country. The deaths from it for the week ending Aug. 17th, was 648; the total mortality from all diseases 895 in a population of 175,000. The Board of Health has ceased to report, but from the reports of the interments in some of the cemeteries it is evident that its ravages have not diminished. It is estimated that 1300 deaths occurred from it during the week ending August 23d.

New Orleans.—The deaths from cholera on August 22d were 27.

Mobile.—Four deaths from cholera during week ending August 25th.

New York Academy of Medicine on the Preventive and Remedial Treatment of Cholera.—We take pleasure in complying with the request of the President of the New York Academy of Medicine, for the publication of the following preamble and resolutions, adopted by the Academy:—

Whereas, The New York Academy of Medicine has endeavoured to promote among its own members, and throughout the medical profession, a spirit of exact and practical inquiry into the preventive and remedial treatment of epidemic cholera; therefore, be it

Resolved, That this Academy hereby expresses its confidence in the utility of general and specific hygienic measures as the best means of protection against the pestilential prevalence of cholera in any locality where it makes its appearance; and that the most thorough scavenging, cleansing, and disinfection are absolutely necessary means of averting this pestilence in the cities and populous towns of our country at the present time.

Resolved, That in the judgment of the Academy the medical profession throughout the country should, for all practical purposes, act and advise in accordance with the hypothesis (or the fact) that the cholera diarrhœa and "rice-water discharges" of cholera patients, are capable, in connection with well-known localizing conditions, of propagating the cholera poison; and that rigidly enforced precautions should be taken in every case of cholera to permanently disinfect or destroy those ejected fluids by means of active chemical agents; also that with the same object in view, the strictest cleanliness of persons and premises should be enforced upon all who have charge of the sick; also, that all privies, water-closets, and cesspools should be kept thoroughly under the control of disinfectants.

Resolved, That we regard the nature and causes of cholera infection, so far as the sick or their discharges can propagate it, as being so susceptible of control that there should be no fear or hesitancy in the personal care of the sick and all that pertains to them.

Resolved, That immediate and thorough cleansing and disinfection of all persons, clothing, and things that have been exposed to the discharges or persons of the sick with cholera constitutes the chief end and object of any rational quarantine or external sanitary police regulation against cholera.

Resolved, That for the purposes here mentioned, an external sanitary police is desirable in all great maritime and river towns, but that such sanitary regulations need not seriously embarrass commercial intercourse and the interests of trade.

Resolved, That the main source of protection against epidemic cholera at the present time is to be found in the vigilant and effective operation of sanitary measures, municipal, domestic, and personal.

Resolved, That the New York Academy of Medicine cordially invites the physicians of every city and village throughout our country to urge the immediate adoption of adequate measures of sanitary protection against the introduction and ravages of cholera, and to this end we pledge our brethren and the public the hearty and continued coöperation of this Academy.

The above resolutions were unanimously adopted by the Academy.

FOREIGN INTELLIGENCE.

Raw Flesh and Brandy in the Treatment of Phthisis.—The method of treating consumptive diseases by raw meat and alcohol appears, according to M. Fuster's statements, to have been attended with wonderful results. It has now been tried in no less than 2000 cases, and in nearly all successfully. The patients increase in weight

to the extent of two, three, four, or six kilogrammes in the course of two or three weeks. Mr. Fuster recommends the adoption of his treatment for the following maladies: Advanced anæmia, the last stages of ague, typhus and typhoid, leucocythæmia, albuminuria, and diabetes, and also in cases where there has been great loss of blood or seminal fluid.—*Lancet*, July 21, 1866.

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Insufflation of Medicated Powders in Gleet.—Dr. Mallez has contrived an instrument by which medicated powders can be conveyed to the membranous portion of the urethra, a region where lies the cause of the gleet, and which region ordinary injections cannot reach. The instrument is chiefly composed of a catheter opened at both ends, another which glides into it, and an apparatus for receiving and projecting the powders. M. Ricord presented the instrument to the Academy of Medicine of Paris, and cases are mentioned in which excellent results were obtained by insufflating subnitrate of bismuth. It is plain that, by previous micturition, the powder may remain hours in the passage; and it is thought that the vagina, uterus, or any fistulous tract may perhaps be reached in the same way.—*Lancet*, July 28, 1866.

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Cæsarean Section under Local Anæsthesia.—Dr. Newman, of Stamford, has performed Cæsarean section under Dr. Richardson's process, and so far as the operation is concerned, with entire success. The patient had cancer of the os uteri to such an extent as to render delivery *per vias naturales* impossible. The incisions through the abdominal parietes and uterus were painless, and the fœtus and placenta were very easily extracted.—*Med. Times and Gaz.*, July 28, 1866.

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Death from Fear of an Operation.—In a recent number of the *Gazette des Hôpitaux*, M. Cazenave, of Bordeaux, narrates the particulars of an interesting case of death from fear just prior to an operation for lithotomy, and which, had chloroform been administered, would probably have been attributed to its influence. A distinguished veterinary surgeon, about 60 years of age, of good constitution, and possessed of great moral force, had suffered for a considerable period from multiple stricture of the urethra and a highly irritable bladder. After the urine had become purulent and ammoniacal, the presence of four calculi was ascertained. In the hopes of being able to perform lithotrity, M. Cazenave persevered for a considerable time in an endeavour to relieve the painfully spasmodic condition of the urethra. These attempts were most courageously borne by the patient, but he was excessively disappointed when informed that lithotrity, which he was very desirous of undergoing, was out of the question, and that some form of lithotomy was the only operation that was eligible. Of this he was known to entertain a great dread, but, nevertheless, at once gave his consent to its performance, retaining to all appearance his habitual calmness. In consultation it was determined to attempt the bilateral operation, and the patient having been placed and held in position by the assistants, M. Cazenave was on the point of introducing the catheter when the patient, who had exhibited entire calmness and serenity during the preparations, was observed to become pale and faint, and in the course of ten minutes, in spite of all that was done, he died. When this nervous syncope seized him, the operator had not yet even touched him.—*Med. Times and Gazette*, July 28, 1866.

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Social and Moral Condition of the East London Population.—The editor of the *Med. Times and Gazette*, in his No. for Aug. 4th, thus speaks of the squalor of a large part of the East London population who are now suffering so severely from cholera. This squalor "we have seen with our own eyes this week in a Bethnal-green street, where a patient had died in almost every house. In one house the yard was a pool of dirty soapy water, *in which* the water-butt was standing; the butt itself uncovered, dirty, green with mould, containing a host of 'foreign bodies' at the bottom—the privy foul and stinking—the yard strewed with rubbish. Now this is a state of things common amongst the poor from East to West; but why? It is of no use to blame vestries, or medical officers of health, or landlords; granting that they may fail in their duty, why do not the people—the victims—help themselves? Surely any man might in ten minutes raise a water-butt out of a puddle of filth and put it on a few bricks; he might contrive a cover for it; he might sweep up a yard, and pour a bucket of water down a closet and brush it

out, and in the present panic he might get gratis from any vestry enough carbolic acid or chloride of lime to disinfect a street! But the poor will not stir a finger to help themselves. They may be on the look-out for district visitors with money, soup, and tracts, or they may trust to luck or to Providence, or may console themselves by saying that they can't die till their time is come—but they won't stir a finger to help themselves. This cholera is a severe test of our sanitary and hygienic arrangements; it is a still severer one of our social and moral condition."

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Adhesion of Austria to the Neutrality of Army Surgeons.—We see that it is just announced that Austria has at last given in her adhesion to the provisions for the neutrality of Army Surgeons and the wounded adopted by the Geneva Congress, she being the only European power who had not already agreed to them. It would have been more commendable as well as more advantageous for her if she had done this before the commencement than after the termination of the present war. At the battle of Skalitz an Austrian ambulance, posted to all appearance in the best possible manner for the execution of its duties and for securing a retreat if necessary, was suddenly charged from behind by a troop of Prussian cavalry, and the Doctors trodden under foot. The chief Medical officer, Dr. Kloss, was precipitated into the River Aupa, and was seen no more, while another Surgeon was kicked by a horse, and a third killed outright. In a neighbouring ambulance a consultation of Surgeons was suddenly dispersed by a shower of projectiles, leaving behind twenty-six severely wounded soldiers, protected only by a white flag. An ambulance, formed in the woods at the battle of Sadowa, was only discovered by the Prussians two days afterwards, the wounded having been abandoned by their medical attendants, and left without any succour whatever. So, too, 130 wounded were left in a hospital at Lechtomischel, without any succour, until the arrival of the Prussians three days afterwards. It is said, also, that as many as eighteen Austrian Surgeons were either killed or captured. Two prominent members of our profession at Vienna—Professors von Pitha and Hebra—have to deplore the loss of their sons, both Army Surgeons, one killed at Skalitz, and the other wounded and made prisoner.

Lady Volunteer Nurse in the London Hospital.—In the cholera wards of the London Hospital, in a scene of suffering and death sufficient to try the stoutest heart, a lady volunteer nurse has passed her time since the beginning of the epidemic, moving from bed to bed in ceaseless efforts to comfort and relieve. So very youthful and so very fair is this devoted girl that it is difficult to control a feeling of pain at her presence under such circumstances. But she offered her help at a time when, from the sudden inroad of cases, such assistance was urgently required, and nobly has she followed her self-sought duty. Wherever the need is greatest, and the work hardest there she is to be seen toiling until her limbs almost refuse to sustain her. And the effect of the fair young creature's presence has been that the nurses have been encouraged by her never-failing energy and cheeriness, so that dread of the disease has been lost in efforts to combat it. This is an instance of devotion which it would be an insult to praise—it need only be recorded.—*Lancet*, July 28, 1866.

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British Medical Association.—This Association held its annual meeting this year on the 19th August, at Chester. Next year it is to meet at Dublin under the presidency of Dr. Stokes.

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Honours to Medical Men.—The Queen of Great Britain has elevated Sir James Clark to the dignity of Commander of the Order of the Bath; and conferred Knighthood on Dr. Thomas Watson, President of the Royal College of Physicians; both are well worthy of this acknowledgment of their merit.

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Obituary Record.—Died, in Edinburgh, May 17th, David Craigie, M. D.

—— At Worcester, July 30th, in the 73d year of his age, Sir Charles Hastings, M. D., the founder of the British Medical Association, and one of the most eminent and highly esteemed physicians in England.

—— In Paris, July 31st, of cholera, aged 69, M. Gibert, the celebrated Dermatologist of the Hôpital St. Louis. Mr. G. had for several days suffered from premonitory diarrhœa, but neglected to take any measures to arrest it, as he had always ridiculed the significance of such prodrome. He fell a victim to that error of judgment.

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